

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA  
 YAVAPAI COUNTY, ARIZONA  
 FOR THE COUNTY OF YAVAPAI

DEC-6 AM 11:48

SANDRA K MARKHAM, CLERK  
 BY: *Stephanie Kling*

STATE OF ARIZONA, )

Plaintiff, )

vs. )

Case No. V1300CR201080049

JAMES ARTHUR RAY, )

Defendant. )

REPORTER'S TRANSCRIPT OF PROCEEDINGS  
 BEFORE THE HONORABLE WARREN R. DARROW

TRIAL DAY TWENTY-THREE

MARCH 29, 2011

Camp Verde, Arizona

(Partial transcript.)

**ORIGINAL**

REPORTED BY  
 MINA G. HUNT  
 AZ CR NO. 50619  
 CA CSR NO. 8335

1 IN THE SUPERIOR COURT OF THE STATE OF ARIZONA  
2 FOR THE COUNTY OF YAVAPAI

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4 STATE OF ARIZONA, )  
5 Plaintiff, )  
6 vs ) Case No. V1300CR201080049  
7 JAMES ARTHUR RAY, )  
8 Defendant. )  
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25 MINA G. HUNT  
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1 Proceedings had before the Honorable  
2 WARREN R. DARROW, Judge, taken on Tuesday,  
3 March 29, 2011, at Yavapai County Superior Court,  
4 Division Pro Tem B, 2840 North Commonwealth Drive,  
5 Camp Verde, Arizona, before Mina G. Hunt, Certified  
6 Reporter within and for the State of Arizona.  
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## PROCEEDINGS

(Partial transcript -- testimony of witness.)

THE COURT: We're on the record in State versus James Arthur Ray, who is present with his attorneys, Ms. Do, Mr. Li, and Mr. Kelly. The state's represented by Ms. Polk and Mr. Hughes. The jury is present.

Good morning.

And the state may call its next witness.

Mr. Hughes.

MR. HUGHES: Thank you, Your Honor. The state calls Dr. Brent Cutshall.

THE COURT: Okay.

Doctor, if you'd please step to the front of the courtroom where the bailiff is directing you.

Raise your right hand and be sworn by the clerk.

BRENT M. CUTSHALL, having been first duly sworn upon his oath to tell the truth, the whole truth, and nothing but the truth, testified as follows:

THE COURT: Please be seated here to my right.

Sir, if you'd please start by stating and

spelling your full name.

THE WITNESS: Brent Marsden Cutshall, B-r-e-n-t. Marsden is M-a-r-s-d-e-n; Cutshall, C-u-t-s-h-a-l-l.

THE COURT: Thank you.

Mr. Hughes.

MR. HUGHES: Thank you.

## DIRECT EXAMINATION

BY MR. HUGHES:

Q. Sir, can you tell us what you do for a living.

A. Critical care pulmonologist.

Q. And can you tell us from what part of the state you come from.

A. Originally from Nebraska. I've moved around a lot with training from that point on.

Q. Is there a particular part of the state of Arizona, though, that you now primarily work in?

A. I practice in Flagstaff at this point.

Q. And how long have you been practicing in Flagstaff?

A. About three years.

Q. And did you have to have any special education to become a doctor up in Flagstaff?

A. For critical care I had to do four years

of medical school, three years of internal medicine training and a three-year fellowship in pulmonology and critical care.

Q. And can you walk us through just briefly what medical school you went to.

A. Initially went to the University of Nebraska and then went to residency at University of New Mexico, Albuquerque. I did pulmonology critical care at Oregon, in Portland.

Q. And do you have any board certifications?

A. Certification in internal medicine, pulmonology and critical care.

Q. And how long have you been board certified in those areas?

A. In the last -- all three areas it's been for about six years.

Q. And do you have any privileges at any hospitals?

A. Flagstaff Medical Center.

Q. And can you tell us what "hospital privileges" mean?

A. I have acting privileges to treat and care for patients in that facility.

Q. And can you tell us what your employment has been in the medical field up in Flagstaff for

the last three years?

A. I've had the same position doing critical care work, also have a pulmonology clinic. I'm affiliated with two groups that cover both of those areas, predominately critical care.

Q. And can you tell the jury what you mean by "critical care work."

A. Predominantly working in the intensive care unit, so most of the work we do is with patients that are on ventilators and on life support and critical illness.

Q. Do you recall whether you treated a patient named Liz Neuman back in 2009?

A. Yes, I did.

Q. And do you remember how she came to arrive to be treated by you?

A. She came from this area by -- I'm not sure if it was by ambulance or not. She was initially evaluated in the emergency department of our hospital and admitted to our services after that.

Q. And do you remember what day she arrived?

A. I can look -- is it the 8th?

Q. Would looking at her medical records help to refresh your recollection?

1 **A. It would help. Yes.**

2 **It was October 8, 2009.**

3 **Q. Okay.**

4 Your Honor, the state would move to admit  
5 Ms. Neuman's medical records, which are 365, 366,  
6 367, 368 and 791.

7 THE COURT: Ms. Do?

8 MS. DO: No objection, Your Honor.

9 THE COURT: Okay. 365, 366, 367, 368, and 791  
10 are admitted.

11 (Exhibits 365-368 and 791 admitted.)

12 **Q. BY MR. HUGHES: And, Doctor, you**  
13 **mentioned the date that she arrived. What date was**  
14 **that again?**

15 **A. It was October 8, 2009.**

16 **Q. And do you remember about what time she**  
17 **arrived in the emergency department?**

18 **A. I'm not exactly sure the emergency**  
19 **department time. I initially saw her in the ICU**  
20 **about 10:30 p.m., I think.**

21 MR. HUGHES: Your Honor, may I approach?

22 THE COURT: Yes, you may.

23 **Q. BY MR. HUGHES: Doctor, I'll show you**  
24 **Exhibit 365 and specifically Bates No. 2600. Can**  
25 **you tell me what sort of record that is.**

1 **A. It's just a preliminary history and**  
2 **physical exam and note I've written.**

3 **Q. Okay. And does that have a time on it?**

4 **A. I don't see one on this note. The**  
5 **emergency department says 1846.**

6 **Q. Okay. And can you tell me what that --**  
7 **you said the emergency department says. Is that a**  
8 **time that the emergency department wrote down?**

9 **A. That was when she was initially evaluated**  
10 **in the emergency department. I saw her**  
11 **subsequently after that.**

12 **Q. Okay. And that record that I showed**  
13 **you -- is that something that would have, then,**  
14 **been generated when she first arrived or around the**  
15 **time she first arrived?**

16 **A. I believe so. Yes.**

17 **Q. Do you happen to recall what Ms. Neuman's**  
18 **vitals were when she arrived?**

19 **A. Um --**

20 **Q. And then I'm going to ask you what vitals**  
21 **are.**

22 **A. Specifically are you asking the time she**  
23 **arrived in the intensive care unit or the emergency**  
24 **department?**

25 **Q. At the emergency department.**

1 **A. I don't have those numbers in front of**  
2 **me. I guess I've got a set. I don't have a full**  
3 **set of vital signs. It says temperature was 38.7,**  
4 **blood pressure was 130 to 140 with respiratory rate**  
5 **of 30, and a blood pressure was 204 over 79 at that**  
6 **time. That was recorded in the emergency room.**

7 **Q. And do you happen to know what her**  
8 **temperature was when she arrived?**

9 **A. 38.7 was rectal temperature they did in**  
10 **the emergency department.**

11 **Q. And do you know what time that was taken?**

12 **A. This would have been soon after arrival**  
13 **there. So I think close to the emergency room**  
14 **times. It doesn't list the specific time on this**  
15 **note I'm looking at.**

16 **Q. And, Doctor, I'm going to show you**  
17 **Exhibit 366. And specifically I'm going to show**  
18 **you page 3208. I'm going to ask if you recognize**  
19 **that document?**

20 **A. This appears just to be a computer**  
21 **generated vital signs generated throughout the**  
22 **emergency department stay.**

23 **Q. And do you know, does that document**  
24 **indicate what time her temperature was taken that**  
25 **afternoon or that evening? I'm sorry. I should**

1 have showed you page 3205, which might speed things  
2 up.

3 **A. I'm not seeing a temperature on this**  
4 **page.**

5 MR. HUGHES: May I approach, Your Honor?

6 THE COURT: Yes.

7 **Q. BY MR. HUGHES: Does this -- I'm**  
8 **referring to the bottom of page 3205. Does that**  
9 **show a rectal temperature?**

10 **A. Yeah, it does. That's the 38.7 at 1858.**

11 **Q. And can you tell me whether -- how**  
12 **temperatures are taken typically at the emergency**  
13 **department.**

14 **A. They do both, with the ear and with the**  
15 **rectal. The rectal is generally considered to be a**  
16 **little more accurate.**

17 **Q. Does the temperature taken in the ear --**  
18 **does that have a particular term to it?**

19 **A. I don't know what the term you're looking**  
20 **for.**

21 **Q. Do they call that a "tympanic**  
22 **temperature"?**

23 **A. Yes. That's correct.**

24 **Q. And you mentioned the rectal temperature**  
25 **is a little more accurate?**

1 **A. Yes.**  
 2 **Q.** Can you tell us why that would be.  
 3 **A. Just more of a core temperature in**  
 4 **general. The probe is inserted in the body to give**  
 5 **us a more accurate reading.**  
 6 **Q.** And do you know whether -- you mentioned  
 7 the rectal temperature at 6:58. Do you know  
 8 whether a tympanic temperature was also taken  
 9 around that time?  
 10 **A. I'm not sure of that.**  
 11 **Q.** And refer you to page 3209.  
 12 **A. Here it's 36.8 at 1850.**  
 13 **Q.** Would that be, then, about eight minutes  
 14 before the other temperature?  
 15 **A. Correct.**  
 16 **Q.** When a -- can you tell me what  
 17 Ms. Neuman's heart rate was when she arrived at the  
 18 emergency department.  
 19 **A. 140 is what's here at 1900.**  
 20 **Q.** And when someone like a patient presents  
 21 at the emergency department, say, for example, in  
 22 Ms. Neuman's case, how does the -- how does someone  
 23 go about determining what's wrong with the patient  
 24 and how to go ahead and treat that patient?  
 25 **A. From our standpoint it's kind of**

1 **complicated because there was an initial event that**  
 2 **happened. Also at this point all the patients were**  
 3 **already intubated and had been treated in the field**  
 4 **to some extent by EMS.**  
 5 **So we were trying to assess and stabilize**  
 6 **vital signs and also look for any causative factors**  
 7 **or ingestions or things that could have been**  
 8 **contributing to the abnormalities.**  
 9 **So a lot of what we're doing is**  
 10 **continuing with stabilization, trying to lower**  
 11 **heart rate, control blood pressure, and protect the**  
 12 **airway, those kind of thing emergently and trying**  
 13 **to get as much information as we can get from**  
 14 **there.**  
 15 **Q.** And you mentioned that a lot of patients  
 16 arrived. Are you familiar with whether other  
 17 patients arrived from the same incident that  
 18 Ms. Neuman was involved in?  
 19 **A. I believe there was four patients total**  
 20 **that arrived.**  
 21 **Q.** And do you happen to know what their  
 22 names were?  
 23 **A. I can reference it real quick. It was**  
 24 **Teresita Wong, Sidney Spencer. And Stephen Ray was**  
 25 **the fourth.**

1 **Q.** And did you treat any or all those  
 2 patients?  
 3 **A. I treated Liz Neuman, Sidney Spencer and**  
 4 **Teresita Wong.**  
 5 **Q.** Can you tell me whether there is any  
 6 indication that Ms. Neuman was suffering from  
 7 carbon monoxide poisoning?  
 8 **A. That was a concern because we'd heard**  
 9 **about potential smoke exposure. But her level --**  
 10 **you said Elizabeth Neuman specifically?**  
 11 **Q.** Yes. Specifically. And I'll ask you  
 12 about the other patients you treated also. But  
 13 with respect to Ms. Neuman, do you recall whether  
 14 there was any indication of carbon monoxide  
 15 poisoning?  
 16 **A. There was not. Her carboxyhemoglobin**  
 17 **level was two percent, which is a normal level, not**  
 18 **a toxic level.**  
 19 **Q.** And how was that carboxyhemoglobin level  
 20 tested?  
 21 **A. It's an arterial blood test that's drawn**  
 22 **that directly measures those levels.**  
 23 **Q.** And can you tell me what the test was  
 24 looking for.  
 25 **A. Specifically it's the carboxyhemoglobin**

1 **level and percentage. If it's an elevated**  
 2 **percentage, it's indicative of significant exposure**  
 3 **of carbon monoxide.**  
 4 **Q.** And how was a person -- how could a  
 5 person be exposed to carbon monoxide?  
 6 **A. Well, it's typically from smoke or**  
 7 **incomplete combustion of other generations of that**  
 8 **gas itself. But the concern was in this case there**  
 9 **had been a fire where there was smoke exposure.**  
 10 **Q.** If a person is in an enclosed space  
 11 that's being heated by something other than a fire,  
 12 would you have the same concerns for carbon  
 13 monoxide poisoning?  
 14 **A. Generally the fire itself. That would be**  
 15 **the concern unless there was another kind of gas**  
 16 **leak itself.**  
 17 **Q.** And if someone was in an enclosed space  
 18 with a number of other people, would there be a  
 19 concern about them being exposed to the other  
 20 people's breath?  
 21 **A. I think it would be a rare instance where**  
 22 **that would cause -- if there was enough people in**  
 23 **the room, I guess in theory it could happen. But**  
 24 **not very often.**  
 25 **Q.** And do you know whether Ms. Neuman

1 exhibited any signs or symptoms of dehydration?

2 **A. I'd say the blood pressure. When she**  
3 **first came in in the 140s is consistent with a low**  
4 **flow pressure and dehydration.**

5 **Q.** And when Ms. Neuman arrived, was she  
6 already being treated by the emergency department?

7 **A. Yes.**

8 **Q.** And by "emergency department," I mean  
9 like an ambulance service or helicopter ambulance  
10 service.

11 **A. I think both. Transport service**  
12 **initially was treating her, and then she was**  
13 **further treated in our emergency department before**  
14 **I'd seen her.**

15 **Q.** And can you indicate what some of the  
16 signs or symptoms would be that you'd expect to see  
17 in a patient presenting with dehydration.

18 **A. I think just on physical exam there is**  
19 **some finding of dry mucosa in the mouth. Just dry**  
20 **appearance in addition to that. The vital signs**  
21 **would reflect that as well. Typically low blood**  
22 **pressure and fast heart rate would be an indication**  
23 **there is low circulating volume and dehydration.**

24 **Q.** You mentioned Ms. Neuman's heart rate in  
25 the emergency department when she presented. Would

1 you consider that -- how would you characterize  
2 that heart rate?

3 **A. Would be considered tachycardia or**  
4 **definitely an elevated, fast heart rate.**

5 **Q.** What would a normal heart rate be  
6 considered for someone presenting in an emergency  
7 department?

8 **A. I guess the qualification of the**  
9 **emergency department changes things. I'd say a**  
10 **normal one in general is -- in a tachycardia it**  
11 **would be classified as less -- greater than 90. So**  
12 **she was 140. Normal is less than 90.**

13 **Q.** Is there also a condition called  
14 "bradycardia"?

15 **A. Yes.**

16 **Q.** And can you tell us what that is.

17 **A. Slow heart rate. The cutoff would**  
18 **roughly be between less than 60. 60 to 90 would be**  
19 **the normal.**

20 **Q.** Would you say that Ms. Neuman was  
21 suffering from bradycardia?

22 **A. No.**

23 **Q.** Can you tell us whether Ms. Neuman had  
24 any signs or symptoms of heat exposure or heat  
25 stroke?

1 **A. She appeared flushed. I think the**  
2 **tachycardia also is consistent with that. The**  
3 **temperature was elevated at 38.7, although it can**  
4 **be higher than that with heat stroke also. Lots of**  
5 **times it's greater than 40.**

6 **Q.** If you were to assume that a patient  
7 takes a while, 40 minutes or so, to get to the  
8 emergency department, would you expect the  
9 temperature of that patient to remain up in the 40  
10 range if they're suffering from heat stroke?

11 **A. I think it could. I think there are also**  
12 **probably measures from the EMS that were trying to**  
13 **cool her as well if it was high when they first got**  
14 **it. I don't know what the readings were in the**  
15 **field.**

16 **Q.** Is the temperature determination for heat  
17 stroke -- is that temperature more reliable the  
18 closer in time you get to the point of the exposure  
19 to heat?

20 **A. I would say yes.**

21 **Q.** If someone was laying out in 60-degree  
22 weather, would you expect their body to start  
23 cooling after they'd been exposed to heat?

24 **A. If they were in 60-degree weather?**

25 **Q.** 60 to 70 degrees, in that range, with wet

1 skin?

2 **A. It cools to an extent. But there is a**  
3 **pretty base core temperature that typically**  
4 **remains.**

5 **Q.** Do you know how quickly or slowly the  
6 core temperature is going to cool?

7 **A. Just in regular room air or --**

8 **Q.** Again, as a hypothetical, say, if  
9 Ms. Neuman was taken away from where the heat was  
10 and laid out in 60- to 70-degree weather for 30  
11 minutes or so with wet skin. How quickly or at all  
12 would you expect to see her core temperature drop?

13 **A. That's a difficult question to answer**  
14 **because there is a lot of other things potentially**  
15 **with complications that had developed at that**  
16 **point. Be hard to -- it should stay within a**  
17 **normal range all the time if there is not anything**  
18 **else going on.**

19 **Q.** What do you mean it should stay within  
20 the normal range?

21 **A. I mean, it's just one of the things in**  
22 **the body that's carefully regulated. Your core**  
23 **temperature doesn't stray much one way or the**  
24 **other. There is a lot of compensation your body**  
25 **will do to keep in a certain range.**

1 **When you start to see the illness and the**  
 2 **complications from your temperature stray one way**  
 3 **or the other, that's when you start having**  
 4 **abnormalities and stuff that develops. Under**  
 5 **normal conditions the body stays in a very tight**  
 6 **range of temperature.**

7 **Q.** And turning back, then, to heat stroke,  
 8 first of all, can you tell us is there a difference  
 9 between heat stroke and hyperthermia?

10 **A.** There can be other reasons to have  
 11 hyperthermia besides heat stroke. Yes.

12 **Q.** Okay. Can you explain what you mean by  
 13 that.

14 **A.** There is other medical conditions that  
 15 could cause high temperatures. The heat stroke  
 16 implies an exposure just to warm temperatures that  
 17 cause the problem. There can be reactions to  
 18 medications, and there is a neuroleptic malignant  
 19 syndrome that causes high temperatures, and other  
 20 things that can just be unrelated to temperature  
 21 exposure that can cause dysregulation of your  
 22 temperature.

23 **Q.** Would an example that if you're a young  
 24 child, for example, develops a really high fever?

25 **A.** Yeah. I mean, that's, I would say,

1 different etiology there. It would be infection  
 2 related rather than exposure related.

3 **Q.** And can you tell us, then, what heat  
 4 stroke is on the body, what effect it has on the  
 5 body.

6 **A.** There is a spectrum of effects it can  
 7 have. Heat stroke can be relatively mild and just  
 8 cause flushing and fatigue and some minor symptoms  
 9 that aren't treated in the hospital. It can cause  
 10 some severe dysfunction of organs too, what we call  
 11 "multisystem organ failure," where that leads to  
 12 significant injury to a lot of organs in the body.

13 **Q.** Do heat illnesses, then, lie upon a  
 14 continuum?

15 **A.** Yes.

16 **Q.** And can you tell us, then, what the  
 17 extremes of the two ends of the continuum would be.

18 **A.** I think, just as I mentioned, it can just  
 19 be some basic feelings, being flushed, warm, having  
 20 to sit and rest a little bit and drink some fluids.  
 21 And it recovers quickly.

22 The extent -- the other extent is it can  
 23 be life threatening. You can have severe brain  
 24 injuries that can result, organ system failure that  
 25 can result from it.

1 **Q.** And you mentioned the feeling warm,  
 2 needing the fluids. Would that be a stage called  
 3 "heat exhaustion"?

4 **A.** Yes. I would agree with that.

5 **Q.** At some point can continued exposure to  
 6 high temperatures move a person from heat  
 7 exhaustion to heat stroke?

8 **A.** Yes.

9 **Q.** And do you know at what point you as a  
 10 doctor would say this person is now suffering from  
 11 heat stroke rather than heat exhaustion?

12 **A.** I'd say at the point you're developing  
 13 end-organ failure and systemic decompensation from  
 14 it. Tachycardia and cerebral dysfunction and  
 15 things like that. People go into comas or have  
 16 seizures, mental status changes and those kinds of  
 17 things developing a heat stroke.

18 **Q.** And what do you mean by "mental status  
 19 changes"?

20 **A.** Confusion or disorientation. As I  
 21 mentioned, you could have a seizure associated with  
 22 that as well or coma.

23 **Q.** Do you know what Ms. Neuman's mental  
 24 status was at the time she presented at the  
 25 emergency department?

1 **A.** At the time all three -- they were  
 2 intubated already. So they were reported to have a  
 3 low function and felt to be unresponsive in the  
 4 field. And they were intubated and put on sedation  
 5 by the time they arrived.

6 **Q.** If a person has a very low mental status,  
 7 does that raise a concern for their airway, their  
 8 ability to breath?

9 **A.** Yes.

10 **Q.** And is that why a patient would be  
 11 intubated, then, in the field?

12 **A.** Yes.

13 **Q.** Can you tell us what "intubated" means.

14 **A.** It's putting an airway in the throat so  
 15 we can provide oxygen and under those  
 16 circumstances -- there is a balloon that inflates.  
 17 So if there is vomiting or other things that  
 18 happen, it protects the airway, helps to prevent  
 19 some of those contents from getting into the lungs  
 20 also.

21 **Q.** Do doctors have a scale that they measure  
 22 a person's mental status up along?

23 **A.** The most common would be Glasgow Coma  
 24 Scale.

25 **Q.** Can you tell us briefly what the Glasgow

1 Coma Scale is.

2 **A. Yeah. There is three criteria to score**  
3 **to 15. But it's looking at verbal response, motor**  
4 **response and -- then also eye response.**

5 **Q.** And, Doctor, approaching you with  
6 Exhibit 791, which is the emergency air ambulance  
7 company records. I'm going to ask you, does that  
8 indicate what Glasgow Coma Scale Ms. Neuman had  
9 when she first presented to the emergency ambulance  
10 company?

11 **A. It was a score of seven.**

12 **Q.** And can you tell us what a seven means on  
13 the Glasgow Coma Scale.

14 **A. In this case she wasn't opening her eyes**  
15 **even when she as stimulated. She wasn't speaking**  
16 **at all. Basically, unrousable. She did have some**  
17 **motor response and was moving a little bit to**  
18 **stimulation.**

19 **Q.** You mentioned when stimulated. Can you  
20 tell us what you mean by that.

21 **A. We go through just kind of an initial**  
22 **thing. First you kind of, being gentle, tap**  
23 **someone. Eventually you try some more painful**  
24 **stimulus. Lot of times just rubbing the middle of**  
25 **the chest to see if you can get a response. So**

1 **there's a lot of people that won't open their eyes**  
2 **initially. If they have a little bit of**  
3 **discomfort, then they open them and respond.**  
4 **Sounds like she wasn't responding.**

5 **Q.** And then turning your attention to Bates  
6 No. 7855, does that indicate or show you what her  
7 Glasgow Coma Scale was around 7:00 o'clock while  
8 she was still with the ambulance company? I  
9 realize you probably need a magnifying glass to  
10 read this.

11 If you don't -- I realize this isn't your  
12 record. If you don't see it, that's fine.

13 **A. No. Says six was the score.**

14 **Q.** Okay. And can you tell us what a six  
15 means, as opposed to a seven, that she had when  
16 they first made contact.

17 **A. Still very similar. There's a little bit**  
18 **of a change in the motor function, the movements.**  
19 **Otherwise it's about the same.**

20 **Q.** Would you consider that a change for the  
21 better or change for the worse?

22 **A. It's a lower score. Be a change for the**  
23 **worse.**

24 **Q.** If a patient presents at the emergency  
25 department with an I.V. already in, does that make

1 it more difficult to determine whether they were  
2 suffering from dehydration at the scene?

3 **A. The presence of the I.V. wouldn't matter.**  
4 **Depends on how much fluid they receive. That's the**  
5 **bigger issue. If they'd already had several liters**  
6 **of fluid, that would normalize the blood pressure**  
7 **and heart rate.**

8 **Q.** And do you know how much fluid Ms. Neuman  
9 received from the ambulance company?

10 **A. I'm not sure.**

11 **Q.** Do you know whether Ms. Neuman received  
12 and I.V. from the ambulance company?

13 **A. I'm not sure about that either.**

14 **Q.** Would the record that you have from the  
15 ambulance company tell you one way or the other?

16 **A. A lot of times it will mention whether**  
17 **they have it. But this record here for the**  
18 **intubation mentions given medication to the I.V.**  
19 **Must have had one.**

20 **Q.** And how long was Ms. Neuman at Flagstaff  
21 Medical Center?

22 **A. Until October 17. From October 8 to**  
23 **October 17.**

24 **Q.** And did she remain your patient until the  
25 end of her stay?

1 **A. We rotated with coverage. We have 24-7**  
2 **coverage. I was treating her the first two days**  
3 **she was there and the last day she was there.**

4 **Q.** And how was her -- can you give us a  
5 summary of what her medical condition was from the  
6 time she arrived until the time she left the  
7 medical center.

8 **A. She remained critically ill throughout**  
9 **and had really exhibited multiorgan failure. What**  
10 **that refers to is she had numerous organs that had**  
11 **severe injuries that developed as a result of her**  
12 **presentation. She ended up having kidney failure**  
13 **and went on to dialysis.**

14 **She remained on the ventilator for**  
15 **assistance with her breathing throughout her**  
16 **hospital stay. She developed a process called**  
17 **"disseminated intravascular coagulation," which is**  
18 **a blood clotting disorder that we see with critical**  
19 **illness. She also had severe brain injury and**  
20 **really was unresponsive throughout her hospital**  
21 **stay.**

22 **Q.** And are any of those conditions  
23 consistent with or not consistent with heat stroke?

24 **A. Say consistent with you but not specific**  
25 **for. There are other things that can cause that.**



1 Q. Can you explain what the distinction  
2 there that you're referring to.

3 A. The process that we're seeing is -- that  
4 we just mentioned that term -- would be multiorgan  
5 system failure. So there clearly was a severe  
6 insult to her body that resulted in end-organ  
7 damage to a lot of different organs.

8 It's not -- once again, it's not that  
9 heat stroke is the only thing that can cause that.  
10 That could happen from severe infections and a lot  
11 of other things also. Heat stroke can cause that.

12 Q. And can you tell us what some of the  
13 other things are that could cause similar symptoms.

14 A. I'd say -- you know -- sepsis or septic  
15 shock, which is associated with infection, can  
16 cause that. Cancers and malignancies can cause it.  
17 Severe traumas could cause that.

18 Q. Did you see any sign of severe trauma for  
19 Ms. Neuman?

20 A. No.

21 Q. And the sepsis that you mentioned -- was  
22 any testing performed to see if she was suffering  
23 from sepsis?

24 A. It was not felt that she had sepsis on  
25 presentation. There was a question of whether

1 there was some secondary infections that developed  
2 after she'd been there a week or so.

3 Q. Can you tell us what you mean by "upon  
4 presentation"?

5 A. When she arrived in the emergency  
6 department on the first day she was in the  
7 hospital.

8 Q. And you mentioned there was some concern  
9 that a secondary infection developed?

10 A. Her lung function became worse throughout  
11 her hospital stay. There was a concern that she  
12 developed secondary pneumonia at one point.

13 Q. Is that a concern for people who are  
14 intubated?

15 A. It's a concern for anyone intubated.

16 Q. Is it possible or did people consider  
17 whether she may have suffered from poisoning?

18 A. Initially, particularly in carbon  
19 monoxide, it was a big consideration at the  
20 beginning. Blood toxicology screens that were  
21 done, and there was consultation with toxicology  
22 services in the emergency department. All those  
23 tests came back negative. We didn't find a  
24 toxicology etiology for this.

25 Q. You mentioned a toxicology etiology.

1 What do you mean by that?

2 A. Well, if there was just some specific  
3 drug exposure or ingestion would have caused these  
4 problems.

5 Q. If Ms. Neuman was exposed to a toxin  
6 while she was inside the sweat lodge, would you  
7 expect other people to also have been exposed if it  
8 was, say, an airborne toxin?

9 A. Presumably so. Depending on what the  
10 toxin was and what happened, I guess. Not knowing  
11 the circumstances, it's hard to answer.

12 Q. Were there any -- can you tell us what a  
13 toxidrome is.

14 A. I guess that's not a term I typically  
15 use. But I'll just say it's a toxin exposure to a  
16 chemical agent.

17 Q. And can you tell us what the eventual  
18 outcome was for Ms. Neuman in the hospital.

19 A. Based upon her clinical course and all  
20 the information that we had, the family elected to  
21 withdraw support on her, and she passed away after  
22 she was extubated.

23 Q. And prior to the family withdrawing  
24 support, can you tell me what her prognosis was.

25 A. It was felt that her neurological

1 prognosis was poor off medication. She wasn't  
2 responsive to us at all throughout her hospital  
3 stay. Reflects a poor chance of recovery.

4 Q. You mentioned that the family withdrew  
5 the life support. Would Ms. Neuman have continued  
6 to survive on life support, in your medical  
7 opinion?

8 A. I'd say potentially there was some  
9 aspects, but there was a lot of ongoing medical  
10 issues. She was continuing to get blood  
11 transfusions. She was still on dialysis at that  
12 point and still on the ventilator. It wasn't  
13 impossible, but she had a high mortality at that  
14 point.

15 Q. In your medical opinion, would she have  
16 gotten better if she had stayed on treatment?

17 A. That's a hard question. I guess I never  
18 say never. There continued to be a high mortality  
19 at the time she was withdrawn is what I'd consider.

20 Q. Thank you. I want to ask you about  
21 another -- did you -- after the life support was  
22 withdrawn, did you prepare or reach a determination  
23 as to her cause of death?

24 A. Felt to be heat stroke with an anoxic  
25 brain injury. Also listed were disseminated

1 **intervascular coagulation and acute renal failure.**

2 **Q.** And let me put this up, and I'll ask you  
3 some questions about that.

4 What was it, Doctor -- I'm putting up on  
5 the ELMO Exhibit 366, Bates No. 3018.

6 Doctor, can you tell us what it was that  
7 caused you to believe that it was heat stroke that  
8 was the cause of -- one of the causes of death.

9 **A.** I'd say just the constellation of the  
10 presentation here with multiorgan system failure  
11 and an elevated temperature. There wasn't evidence  
12 of other toxic exposures or things to account for  
13 it otherwise. Seemed like it fit clinically.

14 **Q.** You mentioned DIC, or disseminated  
15 intravascular coagulation. Can you tell us a  
16 little more what that is and how you can determine  
17 if a patient is suffering from that.

18 **A.** Let me just summarize it. There is a lot  
19 of blood factors that are involved in clotting  
20 blood. One of the injuries that can happen, again  
21 not specifically to heat stroke, but does happen  
22 with heat stroke, is that this can be disrupted.  
23 And it can just result in a lot of abnormalities  
24 with bleeding and can result in spontaneous  
25 bleeding.

1 There were some -- she had a bloody noses  
2 when she first came in and also had a lot of oozing  
3 from regular I.V. sticks for central lines and  
4 thing like that. We continued to have to give her  
5 blood products throughout her hospitalization. And  
6 those numbers remained abnormal throughout.

7 **Q.** And is disseminated intravascular  
8 coagulation something that you would expect to see  
9 in a person suffering from severe heat stroke?

10 **A.** Yes.

11 **Q.** Your admitting diagnosis also says, acute  
12 renal failure. Can you tell us what that means.

13 **A.** At the time of presentation I believe --  
14 her creatinine was elevated, which is just a marker  
15 of kidney function, at 1.7. Normal would be 1. It  
16 continued to increase throughout the hospital stay,  
17 and she ended up on dialysis as a result of that.

18 **Q.** Can you tell us what effect heat stroke  
19 can have on the organs in the body.

20 **A.** I guess there can be a couple different  
21 effects. One is someone passes out and is laying  
22 in a given position for a while. There can be  
23 muscle breakdown that causes toxicity to the  
24 kidneys.

25 There also can be just low blood

1 pressure. And kidneys and brain are specifically  
2 sensitive to what the blood pressure is. If the  
3 blood pressure drops off, that causes damage to  
4 those organs.

5 **Q.** Can the heat itself have an effect on the  
6 organs?

7 **A.** I think a lot -- I would consider to be  
8 more of a result of low blood pressure and  
9 decreased perfusion into those organs than just the  
10 heat directly.

11 **Q.** And the -- as far as your causes of  
12 death, then, the acute renal failure -- is that --  
13 in your opinion, was that caused by heat stroke in  
14 this case?

15 **A.** Probably. I think it was -- I think what  
16 this whole picture documents is there was a period  
17 of low perfusion, low blood pressure, which was  
18 probably caused by heat stroke.

19 **Q.** And the anoxic brain injury as a cause of  
20 death -- can you tell us what an anoxic brain  
21 injury is.

22 **A.** It's a period when the brain didn't  
23 receive adequate oxygen. Basically, seeing the  
24 same pattern with all the organs we're talking  
25 about, which is kidneys, brain, organs that aren't

1 receiving enough circulation of blood flow and  
2 oxygenation and can sustain injury.

3 What we saw in her case is that she  
4 wasn't waking up and responding to us. It's more  
5 of a global injury that occurs to the brain when  
6 there is not enough blood flow.

7 **Q.** And, in your opinion, was the anoxic  
8 brain injury caused by heat stroke?

9 **A.** I'd say the same thing, that there was  
10 the hypoperfusion also. And that could be caused  
11 by heat stroke as well.

12 **Q.** And, finally, this DIC, disseminated  
13 intravascular coagulation, secondary to heat  
14 stroke. Is DIC something that you would expect to  
15 see caused by heat stroke?

16 **A.** Something that can be caused by heat  
17 stroke. Yes.

18 **Q.** You said probably. Were there other  
19 possibilities for the symptoms that she presented  
20 with that you looked at before you prepared the  
21 death summary?

22 **A.** That was felt to be the most likely  
23 explanation for things at the time of her death.  
24 The other considerations were these things we  
25 talked about before, if there was septic shock or

1 **bad infections or malignancy. We didn't find**  
2 **indication of any of those things.**

3 **Q.** After Ms. Neuman passed away, was she  
4 sent on to the medical examiner?

5 **A. Yes.**

6 **Q.** Have you seen the medical examiner's  
7 report in this case?

8 **A. I have not seen it. No.**

9 **Q.** I believe you mentioned -- one thing I  
10 did want to ask. In some of her medical records  
11 there was speculation that she may have been  
12 involved in a fast. Do you recall seeing that in  
13 some of the medical records?

14 **A. Particularly since I was just involved in**  
15 **the first couple days, I think there was a lot of**  
16 **speculation because we didn't know -- the people**  
17 **that were involved weren't able to answer questions**  
18 **for us. So we didn't know the details.**

19 **Q.** Would the fact that -- and I'm going to  
20 ask you to assume she was not involved in a fast  
21 prior to the sweat lodge event. Would that change  
22 your diagnosis in any way?

23 **A. Wouldn't change the diagnosis. No.**

24 **Q.** You mentioned that you treated some other  
25 patients also at the hospital?

1 **A. Yes.**

2 **Q.** Was one of those patients Sidney Spencer?

3 **A. Yes.**

4 **MR. HUGHES:** Your Honor, the state moves the  
5 admission of Exhibit 222.

6 **MS. POLK:** No objection, Your Honor.

7 **THE COURT:** 222 is admitted.  
8 (Exhibit 222 admitted.)

9 **Q.** **BY MR. HUGHES:** Doctor, do you recall  
10 when it is that Ms. Spencer arrived at Flagstaff  
11 Medical Center?

12 **A. I believe all three arrived at the same**  
13 **time. I don't know the exact time.**

14 **Q.** Do you know approximately when it was  
15 that she first received treatment at the hospital?

16 **A. I don't have the time in front of me.**  
17 **All three arrived real close together, I believe.**

18 **MR. HUGHES:** Your Honor, may I approach the  
19 witness?

20 **THE COURT:** Yes.

21 **Q.** **BY MR. HUGHES:** Doctor, I'm going to show  
22 you Exhibit 222 at Bates 2083. Specifically I'm  
23 going to ask you, there is a statement that says  
24 arrival at triage. Can you tell me what that  
25 means.

1 **A. 1955. That's when they first arrived at**  
2 **the emergency department for evaluation.**

3 **Q.** And do you know whether this patient  
4 arrived in the same ambulance or the same  
5 helicopter as Ms. Neuman?

6 **A. I'm not sure about that.**

7 **Q.** In fact, when we were talking about  
8 Ms. Neuman, isn't it correct that the record  
9 indicated that she was at the emergency department  
10 at 6:46?

11 **A. I believe that's correct.**

12 **Q.** Is it possible, then, that -- is it  
13 possible, then, that Ms. Wong -- excuse me --  
14 Ms. Spencer arrived about an hour after Ms. Neuman  
15 arrived?

16 **MS. DO:** Objection. Leading, foundation.

17 **THE COURT:** Sustained.

18 **Q.** **BY MR. HUGHES:** Well, let me ask you  
19 this, Doctor: According to Exhibit 2083, what time  
20 was Ms. Spencer's initial arrival at triage?

21 **A. 1955.**

22 **Q.** And can you tell us what 1955 is in  
23 12-hour clock time.

24 **A. 7:55 p.m.**

25 **Q.** Do you have an independent recollection

1 of whether Ms. Spencer arrived at the same time  
2 that Ms. Neuman arrived?

3 **A. No.**

4 **Q.** Okay. Do you recall what her vitals were  
5 upon arrival?

6 **A. I don't have a full listing of the**  
7 **emergency room numbers.**

8 **Q.** Well, let's go through the records, then.  
9 See if I can find it here.

10 Do you know whether Ms. Spencer was  
11 exhibiting rapid heart rate or a slow heart rate  
12 upon arrival?

13 **A. The numbers I have in front of me are**  
14 **from the critical care when I saw her sometime**  
15 **later when she was admitted to the ICU. At that**  
16 **time they were normal. Her pulse was 80. I'm not**  
17 **sure what it was in the emergency department.**

18 **Q.** Do you know whether Ms. Spencer -- what  
19 her level of consciousness was when she presented  
20 in the emergency department?

21 **A. She was intubated as well. I'm not sure**  
22 **what the Glasgow coma score was.**

23 **Q.** I'm going to show you page 2083 on  
24 Exhibit 222 and ask if that record talks about what  
25 her Glasgow Coma Scale was when she was initially

1 triaged at the emergency department.

2 **A. For the records I have then is I was told**  
3 **that she had a Glasgow coma score of 10 in the**  
4 **field and it rapidly declined to 6 before she was**  
5 **intubated.**

6 **Q.** And do you know what -- do you happen to  
7 know what her temperature was, then, when she was  
8 first seen at the emergency department?

9 **A. Initial one I saw reported was 36.**

10 **Q.** And what was her pulse?

11 **A. Pulse was 80 again at the time she came**  
12 **into the intensive care unit.**

13 **Q.** Did you have an opinion as to what  
14 illness or illnesses Ms. Spencer was suffering from  
15 when you saw her?

16 **A. I guess the approach was to assume that**  
17 **we had the same process going on with all three,**  
18 **which we didn't know that for sure at the time. We**  
19 **had four patients admitted in a very short time**  
20 **frame.**

21 **Q.** And do you know whether any testing was  
22 done, as it was with Ms. Neuman, to determine if  
23 there was any carbon monoxide poisoning?

24 **A. Yes. There was testing done.**

25 **Q.** And do you know what the results of that

1 testing were?

2 **A. Carboxyhemoglobin was zero.**

3 **Q.** And what does that tell you?

4 **A. No significance carbon monoxide exposure.**

5 **Q.** And do you know whether Ms. Spencer -- if  
6 she arrived at the emergency department at 1755, do  
7 you know whether there was any cooling of  
8 Ms. Spencer before she arrived at the emergency  
9 department and after the sweat lodge ended?

10 **A. I don't know.**

11 **Q.** Is that something that could impact the  
12 relevancy of her temperature at the emergency  
13 department?

14 **A. If she was cooled, it would be lower, I**  
15 **would presume.**

16 **Q.** Were there any signs of dehydration for  
17 Ms. Spencer?

18 **A. It was also felt that she appeared to**  
19 **have a dry mouth and just looked dry.**

20 **Q.** Did she -- did the doctor in the  
21 emergency department note any excess salivation?

22 **A. Not that I'm aware of.**

23 **Q.** And turning your attention -- do you have  
24 the exhibit in front of you?

25 **A. Which one?**

1 **Q.** Good question. It would be Exhibit 222.

2 **A. I'm not sure what that is.**

3 **Q.** This one right here. Turning your  
4 attention to page No. 2084, do you know whether  
5 that indicates whether there is any excessive  
6 salivation noted for Ms. Spencer?

7 **A. The ED records indicate there was no**  
8 **excessive salivation.**

9 **Q.** The -- that same record, Exhibit 2084.  
10 I'll put it up on the ELMO and ask you a question  
11 about it.

12 I'm going to ask you to tell us what this  
13 means, if you can, in layperson's terms. Going  
14 down -- first of all, about halfway down the page  
15 it mentioned a differential diagnosis. Can you see  
16 that?

17 **A. Yeah.**

18 **Q.** We talked about carbon monoxide. It also  
19 indicates a possible opiate overdose. Can you tell  
20 us what would lead a doctor to believe there was a  
21 possible opiate overdose in this case.

22 **A. Without knowing any of the clinical**  
23 **history of the patients that were just found**  
24 **unresponsive, the other thing that would be**  
25 **consistent with that is pinpoint pupils or small**

1 **pupils.**

2 **Q.** Did Ms. Spencer present with pinpoint  
3 pupils?

4 **A. They have them recorded as pinpoint.**  
5 **Yes.**

6 **Q.** And is the medical term for pinpoint  
7 "miotic"?

8 **A. Yes.**

9 **Q.** So if a record refers to miotic or --  
10 it's referring to pinpoint pupils?

11 **A. Yes. "Miotic" would refer to small. And**  
12 **pinpoint is very small.**

13 **Q.** Can you tell us what a pinpoint pupil  
14 looks like. How can you tell someone has --

15 **A. The eyes are just very constricted with a**  
16 **very minimal pupil you can see on examination.**

17 **Q.** And is that a possible indicator, then,  
18 of a narcotic drug or opiate overdose?

19 **A. Yes.**

20 **Q.** Under differential diagnosis it also says  
21 other metabolic disturbances including significant  
22 electrolyte or glucose abnormality.

23 What is that?

24 **A. She's referring to the possibility if the**  
25 **patient would have been diabetic, had very low or**

1 **high blood sugars or there were other significant**  
 2 **abnormalities with electrolytes, kind of salts in**  
 3 **the body, specifically referring to potassium or**  
 4 **other things that can cause abnormalities --**  
 5 **potassium or calcium.**

6 **Q.** And could your electrolyte levels be  
 7 affected by fasting or by going without water for,  
 8 say, a 36-hour period?

9 **A.** They can be. Yes.

10 **Q.** And would you expect to see the same  
 11 level of electrolyte abnormality if after that fast  
 12 the person then had an opportunity to drink water  
 13 or eat food?

14 **A.** They can be corrected to some extent.  
 15 **It's a deficiency that happens that can be**  
 16 **corrected.**

17 **Q.** How long does take to correct that  
 18 deficiency? Do you know?

19 **A.** Depends on how much it was in the first  
 20 place.

21 **Q.** Okay. And then under differential  
 22 diagnosis, it indicates additional considerations  
 23 would be other sedative, hypnotic intoxication.

24 What does that mean?

25 **A.** I think it's just referring to the

1 **fact -- again, this isn't my note. But I believe**  
 2 **it's just referring to any other illicit**  
 3 **substances, something that could be causing mental**  
 4 **status changes. And our tox screens didn't show**  
 5 **those.**

6 **Q.** And it indicates she does not fit any  
 7 other obvious toxidrome. What does that mean?

8 **A.** Again, it's just referring -- we're  
 9 **trying to look for a pattern when people arrived**  
 10 **and try to determine if there was some drug level**  
 11 **that we didn't recognize. Or there can be**  
 12 **characteristic symptoms of certain drug ingestions.**  
 13 **There was nothing obviously characteristic of any**  
 14 **given type.**

15 **Q.** And to make that determination, what are  
 16 the sort of things that you look for in the  
 17 patient?

18 **A.** Again, it's pupils, heart rate, just the  
 19 **skin itself, whether it looks like dehydration or**  
 20 **salivation. It could be a distinction.**  
 21 **Temperature, confusion.**

22 **Q.** Would -- is the presence of miotic pupils  
 23 or pinpoint pupils something that would rule out  
 24 heat stroke for Ms. Spencer?

25 **A.** I don't believe so.

1 **Q.** And I'm not sure if I asked about

2 Ms. Neuman. How were her pupils? Do you recall?

3 **A.** Miotic as well, small.

4 **Q.** And did the presence of small pupils for  
 5 Ms. Neuman rule out heat stroke, as your opinion,  
 6 for her cause of death?

7 **A.** I believe so. The other question is, one  
 8 **thing that gets confusing is this stuff is done --**  
 9 **depends on when other medication were given by EMS**  
 10 **and stuff also. It's not uncommon to get narcotics**  
 11 **when you're intubated in the field.**

12 **So some of these things can be confusing.**  
 13 **And that's why it's challenging to put together**  
 14 **these pictures of what exactly happened. Because**  
 15 **they start getting treated also before we evaluate**  
 16 **them.**

17 **Q.** Now, this record here, still referring to  
 18 page 2084, indicates first two victims had Narcan  
 19 administered. What's Narcan?

20 **A.** It's an antidote for narcotics.

21 **Q.** And can Narcan affect a person's vital  
 22 signs?

23 **A.** It should have little effect unless a  
 24 **patient has had narcotics. If it does reverse**  
 25 **them, it can have an effect -- if they're sedated**

1 **with a narcotic and it's rapidly reversed, they can**  
 2 **become agitated quickly.**

3 **Q.** Do you know whether this patient,  
 4 Ms. Spencer, had Narcan administered?

5 **A.** It appears she did not have it, based on  
 6 this record.

7 **Q.** Do you know whether Ms. Neuman had Narcan  
 8 administered?

9 **A.** I don't know.

10 **Q.** And, Doctor, do you still have in front  
 11 of you the Guardian Air exhibit for Ms. Neuman?

12 **A.** Yes.

13 **Q.** Would referring to that let you know  
 14 whether she had had Narcan administered or not?

15 **A.** I don't see it on there.

16 **Q.** Could you turn your attention  
 17 specifically to the time of 1845.

18 **A.** I do see there was administered at 1845.

19 **Q.** And that record actually refers to Narcan  
 20 by another name; is that correct?

21 **A.** Yes. Naloxone. It's the same thing.

22 **Q.** Did you see any change in Ms. Neuman,  
 23 from the time you saw her on the first day when she  
 24 presented through the end, that was, in your  
 25 opinion, related to the Narcan or the naloxone?

1 **A. That's a very fast-acting drug. If it**  
2 **was given then and I didn't see her for an hour, I**  
3 **wouldn't expect to see a change.**

4 **Q.** Do the report from Guardian Air -- does  
5 that indicate whether any noticeable change in her  
6 condition occurred?

7 **A. Not much of a note describing that. Just**  
8 **says that there was no complications.**

9 **Q.** Turning back to Ms. Spencer and  
10 page 2084, the next line indicates she does not fit  
11 any other -- any other obvious toxidrome. Can you  
12 tell us what the obvious toxidromes could be in a  
13 case like this.

14 **A. Consideration is if there is an**  
15 **anticholinergic effect is one thing that we had**  
16 **wondered about.**

17 **Q.** And, actually, turning now to the line  
18 under that, it mentions a cholinergic (sic  
19 throughout) overdose. Is cholinergic and  
20 anticholinergic (sic throughout) the same  
21 toxidrome or would they be separate toxidromes?

22 **A. They would be the same.**

23 **Q.** And how would -- or what are the factors  
24 that a doctor would be concerned with or lead them  
25 to believe that someone might have a cholinergic

50

1 overdose?

2 **A. Well, they're referring to -- obviously**  
3 **it's the opposite if it's cholinergic versus**  
4 **anticholinergic. The anticholinergic would**  
5 **typically be found with fast heart rate, dilated**  
6 **pupils, flushed skin, urinary retention.**

7 **In this case they're referring to the**  
8 **opposite where there could be defecation if it was**  
9 **cholinergic versus anticholinergic.**

10 **Q.** And in this case the note indicates she's  
11 not showing any evidence of defecation?

12 **A. Right.**

13 **Q.** Or excessive salivation?

14 **A. Right.**

15 **Q.** Are the absence of excessive salivation  
16 and the absence of defecation -- does that help a  
17 doctor to rule in or rule out one of those possible  
18 toxidromes?

19 **A. It could help to rule it in or rule it**  
20 **out. Again, these things can all happen for other**  
21 **reasons too.**

22 **Q.** Okay. And then goes on to say she's had  
23 no bradycardia. Can you tell us whether the  
24 absence of bradycardia is material in determining  
25 if there is a ingestion of something that's

1 cholinergic or anticholinergic?

2 **A. Again, I think the suspicion was that --**  
3 **they're mentioning cholinergic in this case. And**  
4 **one of our concerns in the intensive care unit was**  
5 **anticholinergic, which the features of that were**  
6 **the tachycardia and high temperature, which would**  
7 **be consistent with that.**

8 **Q.** As far as those cholinergic or  
9 anticholinergic, are those references, then, to  
10 toxic substances that a person might have ingested?

11 **A. Potentially so. Yes.**

12 **Q.** And you say "potentially." What do you  
13 mean by that?

14 **A. Yes. Toxic substances. Cholinergic**  
15 **drugs.**

16 **Q.** And does the ingestion of a, say, for  
17 example, cholinergic drug -- does that have  
18 certain features or symptoms that you would expect  
19 to see in a patient who had ingested something that  
20 was cholinergic?

21 **A. I think if it's a cholinergic, he's**  
22 **summarizing those things that he would expect to**  
23 **see, which would be bradycardia, small pupils,**  
24 **stooling. This would be low temperature.**

25 **Q.** Now, we know that he indicated there was

52

1 no bradycardia. Is that correct?

2 **A. Yeah. Pulse was 80.**

3 **Q.** And the note indicates there was no  
4 excessive salivation and no evidence of defecation.  
5 Does that help to rule out, then, a cholinergic  
6 overdose or ingestion?

7 **A. I'd say those finding are inconsistent**  
8 **with that.**

9 **Q.** Inconsistent with what?

10 **A. The cholinergic overdose.**

11 **Q.** And --

12 **A. There's not a -- you can't look at a**  
13 **patient across the room and say they've had a**  
14 **cholinergic drug. You can have a clinical pattern**  
15 **which would be consistent with cholinergic, which**  
16 **is those features we just summarized.**

17 **Whether -- a fast heart rate and watery**  
18 **mouth aren't consistent to really anything. A**  
19 **combination of a series of these together could**  
20 **suggest one thing as opposed to another.**

21 **Q.** And in this particular case, what do the  
22 combination of symptoms that are reported suggest  
23 to you?

24 **A. My note -- one concern was it was**  
25 **anticholinergic versus cholinergic. Specifically**

1 because the temperature was elevated on  
2 presentation and there was tachycardia and dry  
3 mouth. The pupils were inconsistent with that  
4 because they were pinpoint and not dilated, which  
5 you would expect.

6 Q. And the symptoms that you referred to for  
7 the anticholinergic -- are those -- do any of  
8 them overlap with what you'd expect to see with a  
9 patient who is presenting with heat stroke?

10 A. I'd say specifically the dryness and  
11 tachycardia and high temperature would all be  
12 similar.

13 Q. And then as a doctor, how do you  
14 ultimately make the decision, if you can, as to  
15 whether -- or what is causing the patient's  
16 illness?

17 A. Potentially there can be some drug  
18 screening tests that can show. But a lot of times  
19 these don't know show up for a couple days. And so  
20 a lot of times the clinical -- we need to treat the  
21 patient before we get the results.

22 And so in either case it would be  
23 supportive at this point in trying to rehydrate and  
24 lower the blood pressure and stabilize the airway  
25 and doing the things we were doing.

1 So I think the way to approach it would  
2 be pretty similar in both instances.

3 Q. You mentioned that you would get some  
4 toxicology reports or results?

5 A. Yeah.

6 Q. And do you know, was that done in  
7 Ms. Spencer's case?

8 A. I think there was a preliminary tox  
9 screen which included narcotics and other things.  
10 But there -- I don't believe there was anything  
11 specifically for anticholinergic drugs.

12 Q. Do you know whether any tox screening was  
13 done in Ms. Neuman's case?

14 A. I believe there was just -- there was a  
15 urine tox screen. I don't have the results in  
16 front of me.

17 Q. Let's see if I can find those for you.

18 A. I specifically have that there was  
19 screening for Tylenol and aspirin. And I just  
20 listed a drug screen. But I don't have all the  
21 things included in the drug screen. Blood alcohol  
22 level was negative also.

23 Q. Would that be a standard drug screen  
24 looking for particular types of drugs?

25 A. Yeah. It's typically -- the standard one

1 is usually narcotics and benzodiazepines and  
2 amphetamines.

3 Q. Do you know whether at any particular  
4 time a screening was done for specific -- for  
5 example, in Ms. Spencer's case, a specific  
6 anticholinergic chemical?

7 A. I don't believe so.

8 Q. Why was that?

9 A. Because I think just from a practical  
10 standpoint, the results come back in such a late  
11 time frame that they're not helpful clinically to  
12 treat patients.

13 Q. And do you know whether the same is true  
14 with Ms. Neuman?

15 A. Again, I'm not positive, but I don't  
16 believe so.

17 Q. As far as the don't believe so, is that  
18 in regard to whether she was tested for a specific  
19 toxin of some sort?

20 A. Yeah. I can say I've never seen a result  
21 of any of those toxin screens that were done.

22 Q. Is that something you would have expected  
23 to see before you prepared the death summary that  
24 we reviewed earlier?

25 A. Yes.

1 Q. And did you also treat a patient named  
2 Tess Wong that night at the Flagstaff Medical  
3 Center?

4 A. Yes.

5 MR. HUGHES: Your Honor, the state would move  
6 to admit Exhibit 396, Tess Wong medical records.

7 MS. DO: No objection, Your Honor.

8 THE COURT: 396 is admitted.

9 (Exhibit 396 admitted.)

10 Q. BY MR. HUGHES: And, Doctor, do you  
11 recall approximately when Ms. Wong first arrived at  
12 Flagstaff Medical Center?

13 A. I don't have a time. No.

14 Q. Let me show you what's Bates stamped as  
15 page 2147 of Exhibit 396. Do you recognize what  
16 that record is?

17 A. Looks like a serial vital signs.

18 Q. And when someone arrives at the emergency  
19 department, are they hooked up, for want of a  
20 better word, to a machine that measures their  
21 vitals?

22 A. Yes.

23 Q. Can you tell what us the first -- how  
24 quickly after someone is seen at the emergency  
25 department do they get hooked up to that device?

1 **A. Expect that would be one of the first**  
2 **things that was done when they were there.**

3 **Q.** Does that record, then, show you what  
4 time her first reading was for the vital signs at  
5 the emergency department?

6 **A. Yes. It was 2005, 10:05 p.m. Or**  
7 **8:05 p.m. Sorry.**

8 **Q.** And does that record indicate what her  
9 vitals were, at least temperature and pulse, that  
10 sort of thing, at her arrival?

11 **A. Yes.**

12 **Q.** And what was her temperature at arrival?

13 **A. It was 35.1.**

14 **Q.** And what was her pulse?

15 **A. 108.**

16 **Q.** And as far as temperature and pulse, can  
17 you characterize how those readings are compared to  
18 what you would expect to see in a healthy adult.

19 **A. Say, a low temperature and a high pulse.**

20 **Q.** What would you expect to see as a normal  
21 temperature in a healthy adult?

22 **A. Typically closer to 37.**

23 **Q.** And we've already talked about the pulse.  
24 As far as her arrival at 8:00 o'clock, is it  
25 possible that she cooled before her arrival at the

1 emergency department?

2 **MS. DO:** Objection. Calls for speculation,  
3 foundation.

4 **THE COURT:** Overruled.

5 You may answer that.

6 **THE WITNESS:** Yes.

7 **Q.** **BY MR. HUGHES:** And, Doctor, what was  
8 Ms. Wong's mental status, if you know, at the time  
9 she presented at the emergency department?

10 **A. She was also intubated. So she'd already**  
11 **been sedated and was unresponsive.**

12 **Q.** And do you know what her pupils looked  
13 like?

14 **A. They were small as well.**

15 **Q.** And how was her blood pressure?

16 **A. The initial one was 113 over 74.**

17 **Q.** And what was your diagnosis as far as her  
18 medical condition at Flagstaff Medical Center?

19 **A. Respiratory failure and coma. She also**  
20 **had a collapsed right upper lung and renal failure**  
21 **as well.**

22 **Q.** And was the -- did you have an opinion as  
23 to the cause of the respiratory failure?

24 **A. The coma was the predominant. It was an**  
25 **airway protection issues as well with the coma.**

1 **Q.** She was in a coma?

2 **A. Well, unresponsive.**

3 **Q.** And what was your opinion as to the cause  
4 of then the unresponsive mental status? Or did you  
5 have an opinion?

6 **A. I think at that time I would say I didn't**  
7 **know.**

8 **Q.** Do you have an opinion today?

9 **A. Potentially heat stroke. Although, it's**  
10 **limited by the fact that the temperature was not**  
11 **elevated when she presented. That's not an**  
12 **absolute.**

13 **Q.** Would your determination of the cause of  
14 that mental status being lowered -- would that have  
15 been an easier call for you to make if,  
16 hypothetically, you were able to get a rectal  
17 temperature at the time Ms. Wong left the sweat  
18 lodge as opposed to at 8:05?

19 **A. The additional information would have**  
20 **been helpful earlier.**

21 **Q.** You mentioned a right upper lobe  
22 collapse. Can you tell us what that is.

23 **A. Sounds like there was some difficulty in**  
24 **getting the airway in in the field. And it's not**  
25 **uncommon if the airway is advanced a little bit far**

1 **that it kind of blocks off one of the lobes of the**  
2 **lung. It can temporarily collapse.**

3 **Q.** Is that something you would expect to  
4 see, then, from the emergency medical procedure  
5 that was given to her in the field?

6 **A. Yeah. And it's something that's readily**  
7 **corrected by just repositioning the tube. So there**  
8 **wasn't any damage to the lung.**

9 **Q.** What was her -- what is your opinion  
10 regarding the acute renal insufficiency?

11 **A. In her case it was pretty mild. Her**  
12 **creatinine was 1.1. Normal is 1. Again, it could**  
13 **be consistent with a low blood pressure period or**  
14 **dehydration.**

15 **Q.** And, Doctor, I'm going to show you Bates  
16 No. 2157.

17 Do you recognize that document?

18 **A. Yeah.**

19 **Q.** And can you tell us what it is.

20 **MS. DO:** Your Honor, I have to object.

21 Counsel is putting his own copy, which has been  
22 marked.

23 **MR. HUGHES:** I apologize.

24 **THE COURT:** What's the exhibit number?

25 **MR. HUGHES:** It will be Exhibit 396.



1 Q. And, Doctor, do you have Exhibit 396?

2 A. Yes.

3 Q. Let me take that away from you.

4 A. **This is my copy.**

5 Q. This one right here.

6 A. Oh.

7 Q. And showing you again page 2157.

8 Actually, let's work through since that's the last  
9 page.

10 We're going to start with page 2155. Do  
11 you recognize that document.

12 A. Yes.

13 Q. And what is shown on page 2155?

14 A. **It's an admitting history and physical**  
15 **exam.**

16 Q. And who authored that document?

17 A. I did.

18 Q. And does page 2155 talk about the right  
19 upper lobe collapse that we've already talked  
20 about?

21 A. Yes.

22 Q. 2155 indicates at time of presentation  
23 there were pinpoint pupils and hypotension. What  
24 do you mean by "hypotension"?

25 A. **Initial blood pressure I had recorded was**

62

1 **82 over 54, which is a low blood pressure.**

2 Q. On 2155 you had given the opinion, at the  
3 end of the first large paragraph, that the room  
4 became progressively hotter and led to this  
5 decompensation.

6 What do you mean by "decompensation"?

7 A. **That she was found unresponsive**  
8 **predominately.**

9 Q. And what information did you have at that  
10 time about the conditions inside the sweat lodge?

11 A. **I would say it's limited. And a lot of**  
12 **that was speculation. We just kind of had hearsay**  
13 **from the emergency room.**

14 Q. And is that information that you had at  
15 the time summarized on page 2155?

16 A. Yes. I believe so.

17 Q. And most of it, I think, speaks for  
18 itself. But there are a couple terms I wanted to  
19 ask about. One says, decreased P.O. intake. Do  
20 you see that? Can you tell us --

21 A. **Referring to decreased oral intake,**  
22 **decreased eating, decreased food intake.**

23 Q. And that's information that you were  
24 basing your opinion at least at that time upon;  
25 correct?

1 A. **That's what -- again, that wasn't**

2 **necessarily factual. That's the information we'd**

3 **heard. I'm trying to relay that to future care**

4 **givers to what potentially happened. I don't know**  
5 **the details of what did or didn't happen.**

6 Q. Would the decreased food or water intake

7 for, say, a period of two days -- if that was 36

8 hours instead of two days, would that change your

9 opinion?

10 A. **I think just in general it could be a**  
11 **contributing factor to low blood pressure and**  
12 **dehydration.**

13 Q. What about whether the patient after that  
14 time period of decreased intake through their mouth  
15 they had an opportunity to hydrate and eat some  
16 food? Would that change your opinion?

17 A. **Again, I'd say that's a multifactorial**  
18 **presentation. But it affects that factor.**

19 Q. And how would it affect that factor?

20 A. **Well, if there is dehydration, it can**  
21 **help to get fluids and start to rehydrate.**

22 Q. Okay. So turning from 2155 to 2156, this  
23 indicates a number of vital signs; is that correct?

24 A. **Yeah. And the laboratory.**

25 Q. Okay. And are -- we talked about the

64

1 temperature and the pulse already; correct?

2 A. Right.

3 Q. And the blood pressure. What is an MAP  
4 of 61?

5 A. **It's the mean arterial pressure. So**  
6 **there is a variation in blood pressure with the**  
7 **heart beating or not beating. So that's the**  
8 **average pressure.**

9 Q. And what does that number tell you?

10 A. **Something just specifically that we**  
11 **follow in the ICU on occasion. The systolic and**  
12 **diastolic pressure are reflecting the same thing.**  
13 **She's telling you what the pressure is on average.**

14 Q. Had Ms. Wong woken up by the time you  
15 were doing your evaluation on her she?

16 A. **She had. Yes. At the time I evaluated,**  
17 **she was following commands and responding to us on**  
18 **the ventilator.**

19 Q. Then there are a number of laboratory  
20 results further down on the page?

21 A. Yeah.

22 Q. Were there any laboratory results that  
23 you considered to be pertaining to the issue of why  
24 Ms. Wong was presenting in the emergency department  
25 that night?

1 **A. Well, there is a few abnormal labs. The**  
 2 **white blood cell count was elevated. Can be seen**  
 3 **with infection but can be somewhat nonspecific with**  
 4 **stress. Her liver function tests were elevated.**  
 5 **As we talked about, the kidney function was mildly**  
 6 **elevated.**

7 **And then there was also suggestion on her**  
 8 **urine count that there was a pattern of seeing**  
 9 **large blood but not seeing red blood cells, which**  
 10 **suggests muscle breakdown, which can be**  
 11 **contributing to the kidney function.**

12 **Q. And is the muscle breakdown -- is that**  
 13 **something that you would expect to see or not**  
 14 **expect to see in a patient suffering from heat**  
 15 **stroke?**

16 **A. It's typical to see with someone that's**  
 17 **found down. So if they had mental status change**  
 18 **from any cause and they lay in a same position for**  
 19 **a while, you start to get breakdown of the muscles**  
 20 **from not moving. The circulation is affected in**  
 21 **that area.**

22 **Q. And by "found down," what do you mean by**  
 23 **"down"?**

24 **A. Just someone that's unresponsive, in a**  
 25 **single position. So an unrousable person doesn't**

1 **tend to move. So they start to get muscle**  
 2 **breakdown in the position they're laying. Affects**  
 3 **the circulation in that area.**

4 **Q. You mentioned that there appeared to be**  
 5 **some abnormal liver enzymes?**

6 **A. Yes.**

7 **Q. Can you tell us what you mean by that.**

8 **A. Well, the ALT and AST are both markers of**  
 9 **liver function. They are both mildly elevated.**  
 10 **Again, that can be some degree of injury to the**  
 11 **liver nonspecifically.**

12 **Q. Do you have an opinion in Ms. Wong's case**  
 13 **as to what caused that injury to her liver?**

14 **A. Again, general suggestion of low blood**  
 15 **pressure for a period of time, whether there is an**  
 16 **effect on the kidney as well as the liver.**

17 **Q. Okay turning to the next page, 2157,**  
 18 **where we started out -- about to start out.**

19 **Do you have that page in front of you?**

20 **A. Yes.**

21 **Q. And the assessment plan. What is an**  
 22 **assessment plan?**

23 **A. That's just a summary of the results and**  
 24 **what we intend to do for the care based on that.**

25 **Q. The respiratory failure and the upper**

1 **lobe collapse. We've already talked about that;**  
 2 **correct?**

3 **A. Yes.**

4 **Q. The acute renal insufficiency, it**  
 5 **mentions, is consistent with developing -- I'm**  
 6 **going to mangle the word. But it's rhabdomyolysis.**  
 7 **Can you tell me what that is.**

8 **A. It's a process we're referring to. If**  
 9 **there is muscle breakdown, that causes a toxicity**  
 10 **to the kidney. So that pattern with the -- on the**  
 11 **urinalysis, what happens is the muscle breakdown**  
 12 **components are indirectly read as blood cells on**  
 13 **the test. And that's why it reads large blood.**

14 **But when we look at the actual specimen,**  
 15 **there isn't very many red cells there, which**  
 16 **suggests that this is myoglobin and muscle**  
 17 **breakdown. That's confirmed in her case. The**  
 18 **creatinine kinase is a muscle product. And that was**  
 19 **elevated at 2200.**

20 **Q. And No. 4 is hypotension. Is that the**  
 21 **low blood pressure you were talking about earlier?**

22 **A. Yes.**

23 **Q. And you indicated on that page that there**  
 24 **is some link to dehydration?**

25 **A. Again, I think it's just suggested that**

1 **there was low blood pressure that was contributing**  
 2 **to the kidney failure and other things as well.**

3 **MR. HUGHES: Your Honor, is this the good time**  
 4 **to take the afternoon break?**

5 **THE COURT: The morning break. Yes.**

6 **MR. HUGHES: I've lost half the day.**

7 **THE COURT: Ladies and gentlemen, we'll take**  
 8 **the morning recess. Please be reassembled right**  
 9 **about 11:00 o'clock. Remember the admonition.**

10 **And, Dr. Cutshall, just remind you that**  
 11 **the rule of exclusion of witnesses has been**  
 12 **invoked. You cannot discuss the case or your**  
 13 **testimony with any other witnesses until it's over.**

14 **Thank you. We are in recess.**

15 **(Recess.)**

16 **THE COURT: The record will show the presence**  
 17 **the defendant, Mr. Ray; the attorneys, the jury.**  
 18 **The witness, Dr. Cutshall, is back on the witness**  
 19 **stand having previously been sworn.**

20 **Mr. Hughes.**

21 **MR. HUGHES: Thank you.**

22 **Q. Doctor, can you tell us on this night of**  
 23 **October 8, were you working primarily in the**  
 24 **emergency department or in the intensive care unit**  
 25 **or some other area of the hospital?**

1 **A. Intensive care unit.**

2 **Q.** And did you then see the patients as they  
3 came in originally into the emergency department?

4 **A. I did not.**

5 **Q.** And can you tell us the process by which  
6 a patient gets moved from the emergency department  
7 to the intensive care unit.

8 **A. In this case they're initially evaluated**  
9 **in the emergency department and then transferred to**  
10 **our care in the intensive care unit.**

11 **Q.** And how long -- if there is an average,  
12 how long does it typically take to get from the ED  
13 to the ICU?

14 **A. Depends on what's done in the emergency**  
15 **department. Once they're stabilized to come over,**  
16 **they will. It can take a couple hours if they put**  
17 **a central line in and did some other things.**

18 **Q.** I had a couple questions for you about  
19 one of the topics that we talked about. But I  
20 don't think I asked you a question on it.

21 And that is do you recall with respect to  
22 Ms. Spencer there was some discussion about a  
23 differential diagnosis?

24 **A. Is that on the emergency note**  
25 **specifically?**

1 **Q.** Well, can you tell us what a differential  
2 diagnosis is.

3 **A. Just the possible causes of the**  
4 **presentation.**

5 **Q.** And specifically looking at this report,  
6 which is the report regarding Ms. Spencer, turning  
7 to page 2084 --

8 **MS. DO:** Your Honor, may we have the exhibit  
9 number, please?

10 **MR. HUGHES:** Yes. Exhibit 222.

11 **Q.** Turning to page 2084, the doctor in the  
12 emergency department had some differential  
13 diagnoses. Can you tell us what a differential  
14 diagnosis is.

15 **A. Essentially, just possible diagnosis and**  
16 **based on the presentation and what's suspected to**  
17 **be the problem. The issue is that typically at the**  
18 **time the emergency department evaluates, most of**  
19 **the lab work is not back. So they're trying to**  
20 **relay what their symptoms are and what they're**  
21 **working up as possible diagnoses. I think**  
22 **ultimately you try to hone it down to a specific**  
23 **diagnosis.**

24 **Q.** And is that diagnosis, then, based on the  
25 symptoms that the person presents with in the

1 emergency department?

2 **A. Yes.**

3 **Q.** You -- this report mentions down towards  
4 the bottom cholinergic overdose. And we talked a  
5 little bit about that. Can you tell us what  
6 "cholinergic" means.

7 **A. Means referring to a type of chemical**  
8 **substance that affects the cholinergic receptors.**  
9 **Obviously involved in a lot of organ systems. It's**  
10 **contributing specifically with muscle reaction and**  
11 **the eyes and bowel action and salivation and --**  
12 **it's involved in a lot of different processes in**  
13 **the body.**

14 **Q.** Regarding that cholinergic symptom, the  
15 doctor here indicates in that paragraph miotic  
16 pupils. Is that something that you would expect to  
17 see in someone who had ingested a cholinergic  
18 substance?

19 **A. Yes.**

20 **Q.** And then the doctor says no showing of  
21 any evidence of defecation? Is that something that  
22 you'd expect in a cholinergic overdose?

23 **A. Yes.**

24 **Q.** And says no excessive salivation. Is  
25 that something you would expect?

1 **A. Yes.**

2 **Q.** And said she had no, turning the page,  
3 bradycardia. Is that something that you would  
4 expect?

5 **A. Yes.**

6 **Q.** Okay. Now, you indicated when  
7 Ms. Spencer moved to the -- your department that at  
8 some point you became concerned of an  
9 anticholinergic ingestion; is that correct?

10 **A. Yes.**

11 **Q.** And can you tell us why you were  
12 concerned with an anticholinergic ingestion.

13 **A. My impression is other than the pupils**  
14 **the features were more consistent with an**  
15 **anticholinergic.**

16 **Q.** And what features --

17 **A. Specifically the high temperature,**  
18 **tachycardia and dry mouth. Those are the things**  
19 **that we saw. I'd say the pupils were inconsistent**  
20 **with that, though the pupils were small. And you'd**  
21 **expect dilated pupils with anticholinergic.**

22 **Again, that was really a differential**  
23 **diagnosis at that time and not a confirmed**  
24 **diagnosis.**

25 **Q.** And the -- at some point did you reach a

1 confirmed diagnosis for Ms. Spencer?

2 **A. There was -- I think the toxins were not**  
3 **ever confirmed, and it was felt to be heat stroke**  
4 **or hypoperfusion from low blood pressure.**

5 **Q.** And you said, "hypoperfusion" or "low  
6 blood pressure." Does heat have an effect on a  
7 person's blood pressure, or can it?

8 **A. Indirectly so. But it can result in low**  
9 **blood pressure and decreased perfusion in that**  
10 **sense. Dehydration is probably a beginning symptom**  
11 **of that.**

12 **Q.** Thank you, Doctor. I don't have any  
13 other questions for you at this time.

14 THE COURT: Thank you, Mr. Hughes.

15 Ms. Do.

16 MS. DO: Thank you, Your Honor.

17 CROSS-EXAMINATION

18 BY MS. DO:

19 **Q.** Good morning, Doctor. You and I just  
20 met, I think, 5 or 10 minutes ago?

21 **A. Yes.**

22 **Q.** My name again is Truc Do, and I represent  
23 Mr. Ray. I thank you in advance for your patience.  
24 There has been quite a lot of information covered,  
25 so I'm going to go through it with you and pay a

1 little bit more attention to the medical records  
2 with you.

3 **Q.** Okay?

4 **A. Okay.**

5 **Q.** Let me start first with your medical  
6 training and background. You've been at Flagstaff  
7 Medical Center now for about three years?

8 **A. Correct.**

9 **Q.** Where did you work before that?

10 **A. Portland, Oregon.**

11 **Q.** At a hospital as well?

12 **A. Yes.**

13 **Q.** What is the name of that hospital?

14 **A. Two different hospitals. One was**  
15 **Meridian Park Hospital and St. Vincent's Hospital.**

16 **Q.** Okay. And your specialty is critical  
17 care medicine; is that correct?

18 **A. And pulmonology. I'm boarded in**  
19 **pulmonology, critical care and internal medicine.**

20 **Q.** Okay. And critical care, for the jury,  
21 is the same thing as intensive care?

22 **A. Yes.**

23 **Q.** And that's why you work in the ICU?

24 **A. Yes.**

25 **Q.** As you explained earlier, the ICU is

1 concerned with patients who are critically ill and  
2 oftentimes require ventilators, life support and  
3 other support systems; correct?

4 **A. Correct.**

5 **Q.** You trained or you went to school at the  
6 University of Nebraska; is that correct?

7 **A. For medical school. Yes.**

8 **Q.** Correct. And what year did you graduate?

9 **A. '99.**

10 **Q.** And then after that, you completed what's  
11 been called a "residency" or "fellowship"?

12 **A. Yeah. I did residency and fellowship**  
13 **both.**

14 **Q.** Could you explain to the jury what a  
15 residency and fellowship is.

16 **A. A residency is an internal medicine**  
17 **training. And so that was a three-year training in**  
18 **internal medicine where you get boarded in that.**  
19 **And you need to have that as a prerequisite to do**  
20 **subspecialty training, which is the critical care**  
21 **and pulmonology. That's a fellowship that does**  
22 **that training.**

23 **Q.** That would have been about six years  
24 total that you did?

25 **A. Yes.**

1 **Q.** And during those six years right after  
2 medical school, you would have been treating  
3 patients; correct?

4 **A. Yes.**

5 **Q.** And you mentioned that you are board  
6 certified in a number of different medical fields.  
7 And let me make sure I've got it right. Internal,  
8 pulmonary and critical care?

9 **A. Yes.**

10 **Q.** Is there something specific about  
11 pulmonary critical care?

12 **A. It's two different specialties with two**  
13 **different board exams. And so you can be either/or**  
14 **pulmonary or critical care. But you have to do**  
15 **additional training to be both.**

16 **Q.** And pulmonary is referring to?

17 **A. Lung specialist.**

18 **Q.** Okay. Now, you talked to Mr. Hughes a  
19 little bit about a concept called "differential  
20 diagnoses"?

21 **A. Yes.**

22 **Q.** And I believe the way you described it  
23 was, basically, looking at the possible causes for  
24 the presentation of signs and symptoms. Correct?

25 **A. Correct.**

1 Q. Let me spend a little time with you on  
2 this concept. When patients come to the hospital,  
3 they're going to present with signs and symptoms  
4 that you could observe; correct?

5 A. Yes.

6 Q. And sometimes those signs and symptoms  
7 could be specifically related to one particular  
8 cause. And that would give you an idea of what's  
9 occurring with a patient; correct?

10 A. Yes.

11 Q. And sometimes those signs and symptoms  
12 could be consistent with more than one causes;  
13 correct?

14 A. Yes.

15 Q. And so in differential diagnoses,  
16 sometimes you have two or more diseases or  
17 disorders that would present with the same signs or  
18 symptoms; correct?

19 A. Yes.

20 Q. And so you, as a treating physician, are  
21 going to try and, basically, as you said, hone in  
22 on a more specific cause; is that right?

23 A. Yes.

24 Q. So based upon that, is it correct to say  
25 that there are a number of disorders or diseases

1 that present with signs and symptoms that are very  
2 similar?

3 A. Yes.

4 Q. Okay. And so when you have heat stroke  
5 or severe heat injury, what are the other possible  
6 causes? What is your differential diagnoses there?

7 A. I think one of them is always going to be  
8 infections. So a lot of this is just gathering  
9 history of what exactly happened and what didn't.  
10 If it was someone exposed to a hot area, heat  
11 stroke is possibility.

12 If they recently had infection, that's a  
13 possibility. We'd wonder about malignancy or other  
14 things that could be causing it or just other  
15 history of that illness or known malignancies or  
16 things of that nature.

17 Q. Okay. Let me try and break that down a  
18 little bit more. If somebody comes into the  
19 hospital and they present with an elevated  
20 temperature, you might think if they've been  
21 exposed to heat, that it could be heat illness or  
22 heat stroke; correct?

23 A. Yes.

24 Q. But it could also be an infection that  
25 you referred to as a "sepsis"?

1 A. Yes.

2 Q. Okay. What are your differential  
3 diagnoses when a patient comes in and presents with  
4 miosis or miotic, those pinpoint pupils you talked  
5 about?

6 A. Oftentimes drug effect. And there is a  
7 lot of different drugs that can do that. One thing  
8 that's more common is wondering about narcotic  
9 overdoses. Particularly, as I mentioned, two  
10 things become increasingly confusing as EMS has  
11 treated patients and they're getting drugs from  
12 them. We might not even be evaluating what their  
13 original presentation was.

14 Q. Sure. It's important to understand  
15 what's EMS observations were before any treatments  
16 were given in the field; correct?

17 A. Right.

18 Q. Now, you mentioned overdose, drug  
19 overdose. Are there any other causes that might be  
20 concerning to you if you see a patient in the ER  
21 with pinpoint pupils?

22 A. I think predominantly drug things.  
23 But -- you know -- there is a lot of things that  
24 could affect pupil responses. If there was lesions  
25 in the brain, or other things can be involved with

1 that also. Even direct things wrong with the eye.  
2 So traumas and other things could be  
3 involved. There's kind of a lot of possibilities  
4 of what could be contributing to it.

5 Q. Sure. Let me add one more sign or  
6 symptom if the person is unresponsive. So now you  
7 have someone who is unresponsive and they've got  
8 pinpoint pupils. What then are your differential  
9 diagnoses?

10 A. We've mentioned some of the drug classes.  
11 I think you can go through each class, and most  
12 every one is going to either dilate them or  
13 constrict them. One thing we mentioned was  
14 cholinergic could do that, if there was cholinergic  
15 drugs on board.

16 There's a lot of drugs that have all kind  
17 of effect on these things. So some respects it can  
18 be looking things up, talking with toxicology,  
19 based on the rest of the presentation, going  
20 through it. It is just one factor. It's not that  
21 limiting just to know that one piece of  
22 information.

23 Q. Sure. I understand that. And so one --  
24 and I'm not suggesting that this particular sign or  
25 any sign or symptom is going to tell you

1 conclusively what it might be. But if you see a  
2 patient with pinpoint pupils, you might start  
3 thinking overdose; correct?

4 **A. Yes.**

5 **Q.** You might start thinking ingestion of  
6 some sort of chemical or toxin?

7 **A. Yes.**

8 **Q.** Okay. Are you in your practice as a  
9 doctor -- and I understand your specialization is  
10 in the ICU. You've seen patients that have  
11 suffered from heat stroke prior to this incident?

12 **A. Yes.**

13 **Q.** And we'll talk about heat illnesses and  
14 the continuum that Mr. Hughes referred to. Have  
15 you also treated patients who have come in with  
16 signs or symptoms of ingestion of toxins, poisons,  
17 overdose of drugs, et cetera?

18 **A. Yes.**

19 **Q.** You had mentioned earlier that when this  
20 occurred on October 8, you had limited information;  
21 correct?

22 **A. Yes.**

23 **Q.** And that limited information was what you  
24 described as hearsay coming from the EMS personnel;  
25 is that right?

1 **A. Yes.**

2 **Q.** Okay. So just so the jurors are clear,  
3 you didn't speak to anyone who directly came from  
4 the scene of the incident; correct? By that I mean  
5 a participant or a witness.

6 **A. Not initially. No.**

7 **Q.** Okay. So most of your information came  
8 from the folks who responded to try to help the  
9 people who were down?

10 **A. Yes.**

11 **Q.** Okay. Would you agree with me that as  
12 the treating physician trying to find out what was  
13 ailing these people, you would want more  
14 information?

15 **A. Yes.**

16 **Q.** More information coming from the scene?

17 **A. Yes. As much as possible. It's helpful  
18 to get as much as we can.**

19 **Q.** Okay. And let me ask you. You're here  
20 as a witnesses obviously. You're a treating  
21 physician, and you've been asked a lot of questions  
22 about the possible causes, for example, of  
23 Ms. Neuman's death. And I'm going to ask you some  
24 more. But I want to make this distinction if you  
25 agree with it. You're a treating physician, not a

1 forensic pathologist; correct?

2 **A. Correct.**

3 **Q.** And a forensic pathologist is a medical  
4 examiner?

5 **A. Correct.**

6 **Q.** Whose job it is to determine cause and  
7 manner of death; is that correct?

8 **A. Yes.**

9 **Q.** And if I understood you earlier, your  
10 concern, and as well as the doctors in the ER, your  
11 concern as the ICU doctor is to determine the facts  
12 so that you can immediately treat the patient and  
13 hopefully make them better; correct?

14 **A. Yes.**

15 **Q.** And so one of the things you mentioned is  
16 that you don't have the luxury of time, for  
17 example, to send things out for screenings or  
18 toxicology and labs because there might be a lag;  
19 is that correct?

20 **A. Yes. I think we have -- it's fair to say  
21 we have to start treating a lot of times before we  
22 have all the information.**

23 **Q.** Okay. And sometimes those information or  
24 the information that you send out for will come  
25 back a few days after you have to deal with

1 emergency situations; correct?

2 **A. Yes.**

3 **Q.** Okay. Are you familiar with eMedicine,  
4 by the way?

5 **A. I guess -- well, like TeleMedicine?**

6 **Q.** It's -- I learned this from one of the  
7 other doctors in the state's witness list.  
8 eMedicine is a website, I suppose, that some  
9 doctors, or a lot of doctors, refer to for  
10 diagnostic information. Are you familiar with  
11 that?

12 **A. I am familiar with it.**

13 **Q.** Okay. And have you as a treating  
14 physician consulted with eMedicine?

15 **A. I have not very frequently. No.**

16 **Q.** Okay. Let me start, then, with what  
17 happened on this particular day. On October 8,  
18 2009, you were on duty at Flagstaff Medical Center  
19 when four people presented to your hospital as  
20 critically ill; correct?

21 **A. Yes.**

22 **Q.** You mentioned those people. We're going  
23 to talk about them a little bit more. Liz Neuman,  
24 Tess Wong, Sidney Spencer and Stephen Ray; correct?

25 **A. Yes.**

1 Q. And those folks were initially admitted  
2 to the emergency room; correct?  
3 A. Yes.  
4 Q. And so they would have seen an emergency  
5 room doctor before you'd seen them; correct?  
6 A. Yes.  
7 Q. And then after they were admitted into  
8 the ER and it was determined that they were  
9 critically ill, that they then were turned over to  
10 your care?  
11 A. Yes.  
12 Q. Once you take over care of them in the  
13 ICU, you would have access to all of their charts;  
14 correct?  
15 A. Yes.  
16 Q. You would have access to the information  
17 that the EMS folks, for example, collected in the  
18 field?  
19 A. Yes. But sometimes that's kind of  
20 limited information from them as well. Whatever  
21 they did have we have access to. Yes.  
22 Q. Okay. So, for example, if they observed  
23 and recorded vitals taken in the field, you would  
24 have access to that?  
25 A. Yes.

1 Q. And you would also have access to the  
2 charts and the records generated by anyone in the  
3 emergency room; correct?  
4 A. Yes.  
5 Q. From the nurses to the doctors?  
6 A. Yes.  
7 Q. And that's obviously more information  
8 that's helpful to you in determining the care that  
9 you're going to give these folks in the ICU?  
10 A. Yes.  
11 Q. Okay. Given that you had four patients  
12 who came into your facility -- I understand you  
13 said that you treated three and you didn't treat  
14 Mr. Ray. Is that correct?  
15 A. Yes.  
16 Q. That would be Stephen Ray?  
17 A. Yes.  
18 Q. I noted in his medical record -- and  
19 we'll go through it -- that you were actually  
20 consulted by a Dr. Jeff Daniels. Do you recall  
21 that?  
22 A. We were ready to shift change was the  
23 issue. And so what it ends up getting listed as is  
24 that they called our department. And it depends on  
25 who is on call. One of my other partners did the

1 consult. I didn't do it.  
2 But it's not uncommon to have it listed  
3 at a shift change of which -- they need an  
4 accepting physician. So sometimes they list  
5 whoever is coming on shift even though I didn't  
6 actually evaluate him.  
7 Q. Okay. Did you have any involvement in  
8 his treatment?  
9 A. I wasn't actually treating him. I  
10 covered -- after he was admitted I would have done  
11 cross-coverage for issues. But I didn't actually  
12 write any notes or round on him at any time.  
13 Q. All right. Fair enough. This particular  
14 incident that occurred on October 8 has been  
15 referred to, I believe, in some of the medical  
16 records as a mass-casualty incident. Have you  
17 heard the phrase before?  
18 A. Yes.  
19 Q. Okay. And a mass-casualty incident, or  
20 sometimes abbreviated as MCI, means any incident in  
21 which emergency medical services, such as  
22 personnel, are overwhelmed by the number of  
23 injuries or casualties seen; correct?  
24 A. Yes.  
25 Q. And so by "casualties," so the jury

1 understands, we're talking about injuries or loss  
2 of life; correct?  
3 A. Yes.  
4 Q. So let me give you an example and see if  
5 you agree with this. A mass-casualty incident  
6 could include a situation where you have a two-man  
7 crew go out to a scene of an auto collision and  
8 there is actually three people down. Technically,  
9 that could be a mass-casualty incident; correct?  
10 A. Yes.  
11 Q. But I think most people would think of a  
12 mass-casualty incident as something that occurs on  
13 a larger scale. Correct?  
14 A. Yes.  
15 Q. And in this instance you received four  
16 patients, one of whom is deceased. You did become  
17 aware that there were other participants who were  
18 down and transported to other local hospitals?  
19 A. Yes.  
20 Q. Okay. And that at some point did you  
21 become aware that three actually deceased from this  
22 incident?  
23 A. Yes.  
24 Q. Okay. And then you received at Flagstaff  
25 medical three who were deemed critically ill --

1 Mr. Ray, Ms. Wong, and Ms. Spencer?

2 **A. Ms. Neuman also.**

3 **Q.** I included her in the deceased.

4 **A. Okay.**

5 **Q.** Did you become aware that there were 12  
6 others who were treated at other local hospitals as  
7 noncritical?

8 **A. I think the mass casualty was we didn't**  
9 **know -- we know there was many people found. We**  
10 **didn't know what we were getting, how many we were**  
11 **getting.**

12 **Q.** I see.

13 **A. And there was a point where they said we**  
14 **may be getting 20 people at the hospital. And**  
15 **that's what that term was really referring to.**

16 **Q.** Got it. But you didn't actually receive  
17 20 at Flagstaff?

18 **A. No, we did not. We ended up getting**  
19 **just, as you said, four.**

20 **Q.** When you have a mass casualty, meaning  
21 injuries and loss of life occurs in connection with  
22 one particular incident, is it a fair assumption  
23 that you're looking at perhaps one common causal  
24 agent, meaning one cause of all these injuries and  
25 loss of life?

1 **A. I would say oftentimes yes.**

2 **Q.** Okay. In this particular instance when  
3 you received the four patients with Liz Neuman, you  
4 were her attending physician; correct?

5 **A. Yes.**

6 **Q.** And by attending -- let me have you  
7 explain -- can you tell the jury what "attending"  
8 means.

9 **A. They always admit a patient to one given**  
10 **service and one given doctor, kind of the primary**  
11 **physician. And so I was the primary attending**  
12 **physician.**

13 **Q.** Okay. So you would oversee Neuman's care  
14 regardless of how many other doctors or therapists  
15 involved in her treatment; correct?

16 **A. Yes.**

17 **Q.** With Ms. Spencer I noted that she was  
18 also seen by a Dr. Michael Earl. Do you know  
19 Mr. Earl -- or Dr. Earl?

20 **A. He was one of the emergency department**  
21 **physicians.**

22 **Q.** Okay. And once she was admitted to ER  
23 and treated or seen by Dr. Earl, she was turned  
24 over to your care in the ICU?

25 **A. Yes. I would have been the attending**

1 **physician, and he was the emergency department.**

2 **Q.** Okay. Got it. What about Ms. Wong?

3 Were you also the attending physician?

4 **A. Yes.**

5 **Q.** With respect to Stephen Ray, do you know  
6 whether or not it was Dr. Richard Neff who was  
7 attending?

8 **A. I believe it was Alan Tuttle, who is one**  
9 **of my partners, that was initially the attending.**  
10 **The attending transfers care when they leave the**  
11 **intensive care unit. So we remain attending while**  
12 **they're in the ICU. And once they leave, they**  
13 **generally go to the hospitalist. Richard Neff is**  
14 **one of the hospitalists.**

15 **Q.** Okay. Now, because you had all four of  
16 these patients come from the same incident, did you  
17 talk with the other doctors that night or any day  
18 after to sort of get a big picture of what was  
19 going on with all these patients?

20 **A. Yeah. We were trying to put it together,**  
21 **like you said, presuming they were a similar cause.**

22 **Q.** Okay. When you say we were trying to put  
23 it together, were there consultations between you  
24 and Dr. Neff and Dr. Earl, Dr. Tuttle?

25 **A. Yeah. I did talk with the -- really all**

1 **of them. Dr. Neff really wasn't involved**  
2 **initially. He was involved after three people were**  
3 **stabilized and went out to the regular floor of the**  
4 **hospital. But I talked to the emergency department**  
5 **physicians and Dr. Tuttle.**

6 **Q.** Okay. I'm trying to get a sense of how  
7 this happened, Dr. Cutshall. Were there meetings  
8 held where you all sat down presented your cases?

9 **A. I guess, essentially, since it all**  
10 **arrived at once, they responded in an emergency**  
11 **situation where several emergency department**  
12 **doctors involved right at the very beginning. So**  
13 **there wasn't just one doctor assessing.**

14 **I think Dr. Tuttle was down. He was with**  
15 **our group and was helping just assist them with the**  
16 **initial assessments. And when I came on shift and**  
17 **they were all transferred to me, I went and talked**  
18 **all together among what we thought this was. And**  
19 **the ED had already talked among themselves of what**  
20 **they thought was going on, what was happening. And**  
21 **I tried to get all the information they had when I**  
22 **accepted them.**

23 **Q.** And from this collaboration with you and  
24 the other doctors, did you get the impression that  
25 there were quite a number of similarities in the



1 signs and symptoms that presented by all four of  
2 these patients?

3 **A. There was a number of similarities. Yes.**

4 **Q.** Okay. And I assume that the reason why  
5 you get together with the other doctors treating  
6 the other patients is because that information  
7 might help you in treating your patients?

8 **A. Yes.**

9 **Q.** Okay. Did you ever talk to the doctors  
10 who treated the other folks at the other hospitals?

11 **A. I think there was some calls from the**  
12 **emergency department down there. I didn't speak**  
13 **with them personally.**

14 **Q.** Okay. So then you did not speak to  
15 anyone --

16 **A. I did not.**

17 **Q.** -- at Verde Valley Medical Center?

18 **A. Correct.**

19 **Q.** Or Sedona Medical Center?

20 **A. No, I didn't.**

21 **Q.** Have you at any time since this incident  
22 occurred spoken to any of those doctors, for  
23 example, the doctor -- I believe his name is  
24 Dr. Vincent Furrey -- who treated Kirby Brown and  
25 James Shore and Dennis Mehravar?

1 **A. I didn't speak with any of them**  
2 **personally.**

3 **Q.** Okay. Let me ask you about the contact,  
4 if you've had any, with law enforcement in this  
5 case. Okay?

6 **A. Okay.**

7 **Q.** Have you had any contact with anyone from  
8 the -- from a medical examiner's office?

9 **A. I have not. No.**

10 **Q.** Okay. So you have not spoken to anyone  
11 from Coconino County Medical Examiner's Office?

12 **A. No.**

13 **Q.** Specifically, you've never spoken to  
14 Dr. A.L. Mosley?

15 **A. No, I haven't.**

16 **Q.** Okay. So no one from there has contacted  
17 you to asked you follow-up questions regarding  
18 Ms. Neuman's care or Sidney Spencer or Tess Wong?

19 **A. I never spoke with any of them.**

20 **Q.** What about the Yavapai County Medical  
21 Examiner's Office?

22 **A. No, I didn't.**

23 **Q.** Specifically, you haven't had any contact  
24 with Dr. Robert Lyon or Dr. Mark Fischione?

25 **A. No.**

1 **Q.** Okay. And that would -- just so I can  
2 close this out, that would include any investigator  
3 from these two medical examiners' offices; correct?

4 **A. Correct.**

5 **Q.** What about the Yavapai County Sheriff's  
6 Office? Have you had any contact from them?

7 **A. No.**

8 **Q.** So no detective has ever during the 17  
9 months that this case has been pending contacted  
10 you to ask you to explain the medical records, for  
11 example?

12 **A. Correct.**

13 **Q.** No one from the Yavapai County Sheriff's  
14 Office has contacted you to ask you to give an  
15 explanation of what happened to Ms. Neuman or  
16 Ms. Spencer or Ms. Wong?

17 **A. Correct.**

18 **Q.** What about the Yavapai County Attorney's  
19 Office, Ms. Polk's office? Have you had contact  
20 with them prior to coming in today?

21 **A. Limited contact just to notify me that I**  
22 **was going to be a witness, that I would potentially**  
23 **be called initially and then that they would call**  
24 **me.**

25 **Q.** I understand that you might have had an

1 interview or meeting with Mr. Hughes about a month  
2 ago.

3 **A. Yeah.**

4 **Q.** Okay. Other than that contact, no other  
5 contacts; correct?

6 **A. Correct.**

7 **Q.** For the 17 months this case has been  
8 pending, no one from the prosecutor's office has  
9 called you to ask you additional questions about  
10 what was contained in the medical records?

11 **A. Just the meeting with Mr. Hughes.**

12 **Q.** Okay. And I know that there are a lot of  
13 medical records in this case. Have you had a  
14 chance to review all of them prior to coming in  
15 today?

16 **A. I reviewed a good number of them but not**  
17 **all of them.**

18 **Q.** Okay. I'm going to give them to you so  
19 that we could make this a bit more efficient. And  
20 if at any time you need to refer to these records,  
21 please let me know, and the Judge will permit that.

22 You talked a lot today about disorders  
23 and medical terms. And I have to admit that I'm  
24 obviously not a doctor. And so I'm going to ask  
25 you to help me explain some of these concepts to

1 the jury.  
 2 Okay?  
 3 **A. Okay.**  
 4 **Q.** Let's start by talking about heat  
 5 illnesses. Mr. Hughes has asked you some questions  
 6 about heat and heat stroke. First, with respect to  
 7 heat-related illnesses, you told Mr. Hughes that  
 8 it's something that exists on a continuum; correct?  
 9 **A. Yes.**  
 10 **Q.** And so on the one end you have something  
 11 as mild as heat exhaustion; correct?  
 12 **A. Yes.**  
 13 **Q.** And on the extreme end you have something  
 14 called "heat stroke"; is that correct?  
 15 **A. Yes.**  
 16 **Q.** So in the medical profession those two  
 17 disorders -- heat exhaustion and heat stroke --  
 18 exit on the opposite end of that spectrum; correct?  
 19 **A. Yes.**  
 20 **Q.** And I think that there are more milder  
 21 forms of heat illnesses, like what they call  
 22 "prickly heat"?  
 23 **A. Correct.**  
 24 **Q.** And that's a rash?  
 25 **A. Yes.**

1 **Q.** Or heat cramps; correct?  
 2 **A. Yes.**  
 3 **Q.** Okay. And you said earlier that heat  
 4 exhaustion is a milder form. So typically heat  
 5 exhaustion is not life threatening; correct?  
 6 **A. Correct.**  
 7 **Q.** Assuming that you get your temperature  
 8 under control?  
 9 **A. Correct.**  
 10 **Q.** But heat stroke, assuming there aren't  
 11 interventions to bring your temperature down, can  
 12 be life threatening?  
 13 **A. Yes.**  
 14 **Q.** Okay. And is it fair to say that when we  
 15 look at this continuum where there is heat  
 16 exhaustion on the one end and heat stroke on the  
 17 other end, as the body temperature increases so  
 18 does the severity of the heat injury?  
 19 **A. Yes.**  
 20 **Q.** Okay. Let me first talk to you about  
 21 heat exhaustion. Heat exhaustion in the medical  
 22 field is caused by prolonged heat exposure and  
 23 sodium depletion and dehydration; correct?  
 24 **A. Yes.**  
 25 **Q.** And sodium is what's referred to as an

1 "electrolyte"?  
 2 **A. Yes.**  
 3 **Q.** Okay. You had mentioned earlier a  
 4 threshold temperature of 104 degrees Farenheit. Do  
 5 you recall that?  
 6 **A. I don't know that I mentioned the**  
 7 **temperature.**  
 8 **Q.** Okay. Let me ask you this: What is the  
 9 threshold body temperature that defines heat  
 10 stroke?  
 11 **A. I would say normally, like, 40 degrees**  
 12 **Celsius, which is -- I'm not sure exactly what the**  
 13 **correlation is.**  
 14 **Q.** Okay. Let's assume 40 degrees Celsius is  
 15 the same as 104. Is that your medical opinion is  
 16 the threshold that breaks all the other heat  
 17 illnesses going into heat exhaustion? I'm sorry.  
 18 Heat stroke?  
 19 **A. I'd say it's generally associated with**  
 20 **higher temperatures in that realm, but there is not**  
 21 **a clean-cut number that makes a diagnosis or not.**  
 22 **Q.** Okay. Typically it's 104, or 40 degrees  
 23 celsius?  
 24 **A. As a textbook answer to that, that's the**  
 25 **general number you would be thinking of that.**

1 **Q.** Okay. With respect to --  
 2 THE REPORTER: Excuse me.  
 3 **Q.** BY MS. DO: Heat exhaustion is due to  
 4 sodium depletion and dehydration. The general  
 5 treatment for a patient suffering from heat  
 6 exhaustion is to, one, remove them from the hot  
 7 environment; correct?  
 8 **A. Yes.**  
 9 **Q.** And give them oral replacement of either  
 10 water or electrolytes?  
 11 **A. Correct.**  
 12 **Q.** And that's to rehydrate them?  
 13 **A. Yes.**  
 14 **Q.** So in the milder case, if somebody is out  
 15 in the field and they are feeling the effects of  
 16 heat exhaustion, something like Gatorade or  
 17 electrolyte water could help them; correct?  
 18 **A. Yes.**  
 19 **Q.** And also removing them from the hot  
 20 environment?  
 21 **A. Yes.**  
 22 **Q.** In the more serious cases of mild -- the  
 23 more serious cases of heat exhaustion, you might  
 24 have to actually have I.V. fluids; correct?  
 25 **A. Yes.**

1 Q. Okay. In typical cases of heat  
2 exhaustion, if you remove the person from the hot  
3 environment and you give them electrolytes and  
4 water, the recovery for that person is usually  
5 100 percent -- correct? -- assuming the body  
6 temperature is cooling down?

7 A. **If it's heat exhaustion, I'd say yes.**

8 Q. Okay. And there are no long-term after  
9 effects from someone who has felt the effects of  
10 heat exhaustion; correct?

11 A. **I think it comes down to where it falls  
12 on a spectrum. And there is a fine line between  
13 going from one to the other sometimes. So if there  
14 is injury to an organ, that can be permanent.**

15 Q. Okay. But most cases of milder heat  
16 exhaustion, you're not going to see that kind of  
17 end-organ damage?

18 A. **Usually not. But that's back to the  
19 spectrum.**

20 Q. Got it. Now, heat stroke we already said  
21 or we already talked about, is on the opposite end  
22 and can be life threatening; correct?

23 A. **Yes.**

24 Q. And heat stroke has been referred to as a  
25 "premonitory syndrome" to heat exhaustion; correct?

1 A. **Um --**

2 Q. And by "premonitory," I mean, like, it's  
3 a warning, the warning syndrome before you go into  
4 heat stroke.

5 A. **The exhaustion is premonitory to?**

6 Q. Yes.

7 A. **Yes.**

8 Q. Would you agree with that?

9 A. **Yes.**

10 Q. Okay. So let me try and explain that a  
11 little bit better. Heat exhaustion, if you're body  
12 is not cooled down, will evolve into heat stroke;  
13 correct?

14 A. **It can. Yes.**

15 Q. Okay. And so if your body or core body  
16 temperature reaches a certain threshold -- and I  
17 understand you're saying this is more the textbook  
18 definition. If your body temperatures reaches 104,  
19 in your opinion, you have gone from heat exhaustion  
20 into a possible case of heat stroke; correct?

21 A. **Yes.**

22 Q. Okay. For a person suffering from heat  
23 stroke, the treatment, then, is the rapid reduction  
24 in the body temperature; is that correct?

25 A. **Yes.**

1 Q. And also to aggressively use cooling  
2 measures to bring that body temperature down;  
3 correct?

4 A. **Yes.**

5 Q. Have you ever come across literature or  
6 do you know, in your medical experience, that by  
7 aggressive cooling measures we're talking about  
8 immersing someone in an ice bath?

9 A. **Yeah. Cooling is often -- we do have ice  
10 baths where we would do that. There is actually  
11 literally a bathtub set up. There is also cool air  
12 that does it. But one of the more basic things is  
13 just do ice packs, packing, like, the groin and  
14 under the armpits and stuff can cool temperature  
15 pretty quickly.**

16 Q. Okay. So taking, for example, two cups  
17 of that -- two cups of water the size that you have  
18 on the witness stand and pouring on someone's chest  
19 is not considered aggressive cooling measure  
20 correct?

21 A. **I wouldn't call it an aggressive measure.  
22 Could have some result.**

23 Q. Sure. But when you're talking about  
24 somebody who has reached that danger level of 104,  
25 105, or even 106, you're talking about putting ice

1 packs to the groin area or putting them in an ice  
2 bath or using, I think you said, a fan?

3 A. **Fan. Any of those things that can help  
4 cool. All those would be helpful.**

5 Q. And at your hospital you said you  
6 actually have a bathtub for this?

7 A. **There is one. There is different ways of  
8 cooling. It's actually a protocol now for cardiac  
9 arrest. And so we do this intentionally a lot of  
10 times in the hospital to try to get a low  
11 temperature.**

12 Q. But that is something you have available  
13 to you?

14 A. **Yes.**

15 Q. If you can take somebody who has reached  
16 that level of 104 or 105 degrees Fahrenheit and you  
17 can aggressively cool them down and rehydrate them,  
18 recovery in that instance is usually 80 to 90  
19 percent; correct?

20 A. **It would be high. Yes.**

21 Q. It's high?

22 A. **Yes.**

23 Q. So even though heat stroke is a  
24 life-threatening condition, if you have it, there  
25 are measures that you can use that, then, make

1 recovery 80 to 90 percent possible.

2 **A. Yes. But I'd qualify with -- the**  
3 **restriction is, once again, on the spectrum, if you**  
4 **have organ failure, those become independent**  
5 **problems in their own rights.**

6 **Q. Sure.**

7 **A. If the kidneys are failing and other**  
8 **things are happening, cooling won't fix the problem**  
9 **at that point.**

10 **Q. Got it. And we're going to talk about**  
11 **that. But, generally speaking, if you have a**  
12 **patient coming into the ER and that patient shows**  
13 **signs of heat stroke, the first thing you're going**  
14 **to do as a doctor is to use aggressive cooling**  
15 **measures; correct?**

16 **A. Yes.**

17 **Q. That would include the ice packs to**  
18 **immersing them in that ice bath; correct?**

19 **A. Yes.**

20 **Q. And if you can do that typically in cases**  
21 **where -- and I think you also have to assume the**  
22 **person is healthy, you could have recovery at 80 to**  
23 **90 percent?**

24 **A. Yes.**

25 **Q. Okay. With respect to heat stroke, I**

1 understand that there is something called  
2 "exertional heat stroke" and "nonexertional."  
3 Correct?

4 **A. Correct.**

5 **Q. Could you explain to the jury the**  
6 **difference between the two.**

7 **A. I think the term itself kind of explains**  
8 **it. It's whether or not you're doing activity. If**  
9 **you're a strenuous athlete or -- we see people that**  
10 **come from the Grand Canyon and stuff that are doing**  
11 **strenuous hiking and things and have heat stroke as**  
12 **a result of that.**

13 **The nonexertional could refer -- a lot of**  
14 **time in cities you will have an elderly population**  
15 **with no air conditioning and they're not really**  
16 **doing any activity, but they still are dehydrated**  
17 **and experience similar symptoms without having the**  
18 **strenuous exertion.**

19 **Q. Okay. So in this instance, if we're**  
20 **talking about heat stroke, we're talking about**  
21 **nonexertional; correct?**

22 **A. As I know the history anyway. Yes.**

23 **Q. Okay. These people weren't hiking the**  
24 **Grand Canyon?**

25 **A. That's how I understand those things.**

1 **Q. Okay. So we're talking classic**  
2 **nonexertional heat stroke?**

3 **A. Yes.**

4 **Q. Okay. I want to spend a little bit of**  
5 **time, since you talked about heat stroke, to try**  
6 **and explain to the jury how heat affects the body,**  
7 **why somebody would die from heat.**

8 **A. Okay.**

9 **Q. Bear with me. And, again, thank you for**  
10 **your patience.**

11 **The normal body temperature, as I**  
12 **understand it, is 37 degrees Celsius, or 98.6**  
13 **Fahrenheit. Correct?**

14 **A. Yes.**

15 **Q. And there is a process in our body called**  
16 **"thermoregulation" that helps us maintain that**  
17 **temperature; correct?**

18 **A. Yes.**

19 **Q. The body creates heat from the metabolic**  
20 **processes; correct?**

21 **A. Yes.**

22 **Q. It also takes in heat from the**  
23 **environment?**

24 **A. Yes.**

25 **Q. Okay. And so in order to maintain that**

1 **normal temperature of 98.6, the body has to throw**  
2 **off whatever heat it creates or takes in; correct?**

3 **A. Yes.**

4 **Q. And if the body is not able to do that,**  
5 **you have what's called "thermoregulatory failure"?**

6 **A. Correct.**

7 **Q. Do I have that right?**

8 **A. Yes.**

9 **Q. And so if your body is not able to**  
10 **maintain that temperature of 98.6 and you're**  
11 **getting to an elevated core temperature, lots of**  
12 **bad things are going to happen; correct?**

13 **A. Yes.**

14 **Q. And, as I understand it, thermoregulatory**  
15 **failure is kind of like a chain reaction. One**  
16 **thing leads to other?**

17 **A. Yeah.**

18 **Q. Would you agree?**

19 **A. Yes.**

20 **Q. Okay. So let me try to have you help me**  
21 **explain to the jury what actually happens when the**  
22 **body heats up. Your blood temperature will**  
23 **increase; correct?**

24 **A. Yes.**

25 **Q. And when the blood temperature increases,**

1 your body is going to send out signals to cool it  
2 down; correct?

3 **A. Yes.**

4 **Q.** And one of the things that the brain will  
5 do is tell the body to send the blood to the  
6 surface, meaning the skin; correct?

7 **A. Yes.**

8 **Q.** And that's to increase the surface area  
9 so that you can throw off the heat more  
10 efficiently?

11 **A. The blood vessels dilate and cause the**  
12 **flushing and release of heat.**

13 **Q.** Okay. So two things, then. The body is  
14 going to send the heated blood to the skin to  
15 increase the surface area, and your vessels will  
16 enlarge; correct?

17 **A. Increase the surface area for the heat to**  
18 **be given off.**

19 **Q.** Okay. And that's the first thing the  
20 body will do in an attempt to cool it down when it  
21 gets higher than 98.6; correct?

22 **A. Sweating also.**

23 **Q.** Okay. And we're going to get there. The  
24 second thing that the body will do is to sweat;  
25 correct?

1 **A. Yes.**

2 **Q.** And so those are the two things, the two  
3 primary mechanisms, that the body will do in order  
4 to cool that temperature down to avoid the  
5 thermoregulatory failure; correct?

6 **A. Yes.**

7 **Q.** When your body is sending all of this  
8 blood to the skin and surface, what happens to the  
9 body?

10 **A. Well, I think that you're losing**  
11 **perfusion -- normally your blood flow is kind of**  
12 **focused centrally to your organs. And when your**  
13 **blood flow goes to the arms, your blood pressure**  
14 **can drop.**

15 **Q.** Okay. Because the blood that's getting  
16 sent to the skin or surface area is shunted from  
17 the central areas, your organs, et cetera?

18 **A. Yes.**

19 **Q.** And blood carries what?

20 **A. One thing is oxygen in particular. But**  
21 **also all your electrolytes and nutrition,**  
22 **everything else.**

23 **Q.** Okay. And so because the body reacts by  
24 shunting this blood and sending it to the skin and  
25 surface to throw off this heat, two things happen;

1 right? You are depriving your organs of oxygen;  
2 correct?

3 **A. Yes.**

4 **Q.** And there is dehydration because the  
5 blood carries electrolytes, et cetera?

6 **A. And just the sweating and volume loss too**  
7 **because it contributes to the dehydration and**  
8 **decreased volume.**

9 **Q.** So the sweating and dehydration is part  
10 of the process of your body trying to cool down; is  
11 that correct?

12 **A. Yes.**

13 **Q.** There are risk factors for certain people  
14 who are going to be more vulnerable to heat stroke  
15 or heat illnesses than others; is that right?

16 **A. Yes.**

17 **Q.** What are those risk factors, Doctor?

18 **A. I think you're hydration going into it**  
19 **would be significant. Age but indirectly so. A**  
20 **lot of times age can be with dehydration and other**  
21 **things too. I think that's -- those are the main**  
22 **ones I would think of.**

23 **Q.** Okay. So age, the elderly. And you  
24 referred to some of -- a heat wave?

25 **A. Yes.**

1 **Q.** Typically what happens in a heat wave is  
2 you've got elderly folks inside not a very  
3 ventilated area, and they have what's called  
4 "comorbidity" -- right? -- underlying conditions?

5 **A. Sure.**

6 **Q.** That make their body more susceptible to  
7 the heat stress?

8 **A. Yes.**

9 **Q.** Okay. What about people who are  
10 overweight, who are not physically fit? Are they  
11 more susceptible to heat stress?

12 **A. I think it's common to have a lot of**  
13 **other diseases associated with that. So I would**  
14 **say other organ disease would make you more**  
15 **susceptible in general if there is heart disease or**  
16 **kidney disease to begin with.**

17 **Q.** Typically in classic nonexertional heat  
18 stroke or heat illnesses, the young and healthy and  
19 fit are at less of a risk than the others; correct?

20 **A. In general, yes.**

21 **Q.** Okay. I'm going to talk to you for a  
22 moment here about the signs and symptoms of heat  
23 stroke. And I'm going to use the easel.

24 My colleagues tell me that my handwriting  
25 is really bad. So you will have to bear with me.

1 I want to first talk to you about the  
2 signs and symptoms of heat exhaustion, and then  
3 we're going to move into heat stroke. Okay?

4 Would a sign of heat exhaustion include  
5 fatigue and weakness?

6 **A. Yes.**

7 **Q.** You can read that; right? I'm not being  
8 too bad. What about malaise?

9 **A. Yes.**

10 **Q.** And can you tell the jury what malaise  
11 is.

12 **A. It's kind of a generalized feeling of**  
13 **discomfort. It's associated a lot of times with**  
14 **infections too, with a cold. You just feel badly.**

15 **Q.** Okay.

16 **A. Kind of nonspecific.**

17 **Q.** Nausea. Is that a sign of heat  
18 exhaustion?

19 **A. Yes.**

20 **Q.** And sometimes that's accompanied by  
21 vomiting?

22 **A. Yes.**

23 **Q.** Sometimes abdominal cramps?

24 **A. Yes.**

25 **Q.** What about vertigo or dizziness?

1 **A. I would say yes.**

2 **Q.** Can you tell the jury what vertigo is.

3 **A. In addition to just dizziness, more of a**  
4 **spinning sensation, more of a central, inner ear**  
5 **kind of problem. Causes spinning.**

6 **Q.** Kind of like the world is spinning?

7 **A. Yes.**

8 **Q.** Headache?

9 **A. Yes.**

10 **Q.** Muscle cramps and twitching?

11 **A. Yes.**

12 **Q.** And the muscle cramps and twitching is  
13 caused by the loss of electrolytes; correct?

14 **A. Yes. There is a number of electrolytes**  
15 **involved. But yes.**

16 **Q.** All right. And, finally, you're going to  
17 have signs of dehydration or electrolyte imbalance;  
18 correct?

19 **A. Yes.**

20 **Q.** And it's the dehydration that,  
21 essentially, causes heat exhaustion in addition to  
22 the heat exposure; correct?

23 **A. Yes.**

24 **Q.** Okay. When you have all these signs of  
25 heat exhaustion and your body is not able to cool

1 down, you move into heat stroke; correct?

2 **A. Yes.**

3 **Q.** So in addition to all these things, with  
4 heat stroke you're going to see a change in the  
5 mental status; correct?

6 **A. Yes.**

7 **Q.** Altered mental status could be anything  
8 from confusion, irritability, to something as  
9 severe as coma; is that correct?

10 **A. Yes.**

11 **Q.** With heat stroke, when you see coma, coma  
12 is usually a late-stage finding?

13 **A. Yes.**

14 **Q.** And can you tell the jury what a  
15 late-stage finding is.

16 **A. It's progressed considerably at that**  
17 **point. You would expect to start with more mild**  
18 **confusion and stuff and then progress to an**  
19 **unresponsive state.**

20 **Q.** Okay. So with respect to heat exhaustion  
21 and the continuum to heat stroke, you would also  
22 with altered mental status see somewhat of a linear  
23 progression in the person's change in mental  
24 status; correct?

25 **A. I'd say it should be linear but could be**

1 **rapid if there is not enough blood flow.**

2 **Q.** Sure and by "linear," we mean going  
3 toward or progressing from signs of irritability,  
4 confusion, delirium before you get to something as  
5 serious as a coma?

6 **A. Yes.**

7 **Q.** Okay. Let me stay on the subject for  
8 just a second. With respect to coma, is it correct  
9 that a coma can be caused by brain swelling?

10 **A. Yes.**

11 **Q.** And the brain swelling can be caused by  
12 the process of dehydration and the loss of  
13 electrolytes?

14 **A. The swelling is generally a little bit**  
15 **later finding. So it would be more likely there is**  
16 **low oxygen causing it initially, and then you get**  
17 **secondary swelling.**

18 **Q.** Okay. Got it. The other thing you're  
19 going to see with heat stroke is typically you  
20 would see an elevated core temperature of about  
21 104; correct?

22 **A. Typical, yes.**

23 **Q.** Okay. And I understand there are  
24 variabilities. For example, if you have someone  
25 who's been aggressively or cooled down

1 sufficiently. That's one; correct?

2 **A. Yes.**

3 **Q.** And the other thing is sometimes you just  
4 don't have it recorded. Is that fair to say?

5 **A. Yeah. I mean, the records come in from a**  
6 **lot of places. So even though we have access to**  
7 **everything, it's variable how it's recorded.**

8 **Q.** Okay. But that is typically -- if you  
9 see somebody who has 104, 105, that's a red flag  
10 that you've got something like heat stroke;  
11 correct?

12 **A. It's a high temperature. Yeah.**

13 **Q.** And you talked about something called  
14 "metabolic acidosis."

15 Your Honor, can we inquire if the jurors  
16 are able to see all this?

17 THE COURT: Show of hands of people who are  
18 not able to see.

19 There are some people having difficulty.

20 **Q.** BY MS. DO: Metabolic acidosis is where  
21 you have too much acid in your body fluids;  
22 correct?

23 **A. Yes.**

24 **Q.** You would also have something called --  
25 and I think I'm going to have to go to another

1 page.

2 Mr. Hughes talked to you about it. It's  
3 called -- how do you say that?

4 **A. Rhabdomyolysis.**

5 **Q.** Okay. Is your microphone on?

6 **A. I don't know.**

7 **Q.** This is, basically, the muscle breakdown;  
8 correct?

9 **A. Yes.**

10 **Q.** And you told Mr. Hughes earlier under  
11 direct that metabolic acidosis and rhabdomyolysis  
12 are not specific to heat stroke; correct?

13 **A. Correct.**

14 **Q.** You can see it in other instances?

15 **A. Yes.**

16 **Q.** You might see something called "elevated  
17 creatinine"; is that correct?

18 **A. Yes.**

19 **Q.** Can you tell the jury what creatinine is.

20 **A. Creatinine is related to the**  
21 **rhabdomyolysis where it's a muscle product. So**  
22 **there's a breakdown of muscle, it's an elevated**  
23 **blood test.**

24 **Q.** Okay. In all three of these things you  
25 can see in other --

1 **A. Creatinine is the -- sorry. I misspoke.**

2 **That's a renal function specifically.**

3 **Q.** Okay. So that's why you have sometimes  
4 acute renal failure; right?

5 **A. Yes. Creatinine refers to renal**  
6 **function.**

7 **Q.** Okay. The last page.

8 You talked about something called  
9 "disseminated" --

10 **A. Intravascular coagulation.**

11 **Q.** That's also known as DIC?

12 **A. Yes.**

13 **Q.** Could you explain to the jury what that  
14 is.

15 **A. It's called a "coagulopathy," which**  
16 **refers to -- there is a disruption in the normal**  
17 **clotting factors in the blood. And it kind of**  
18 **predisposes to uncontrolled bleeding or spontaneous**  
19 **bleeding. It's something that tends to be affected**  
20 **by temperature but can be associated with other**  
21 **illnesses as well.**

22 **Q.** And you would see DIC in a lot of  
23 critically ill patients; correct?

24 **A. It's not a common thing to see. Heat**  
25 **stroke is one, but we do see it with septic shock**

1 **and infection and cancer too.**

2 **Q.** Okay. And you talked about something  
3 called "tachycardia," which is fast heart rate;  
4 correct?

5 **A. Yes.**

6 **Q.** And in heat stroke you're typically going  
7 to see blood pressure in the normal to low range;  
8 is that correct?

9 **A. Yes. With dehydration you expect it to**  
10 **be low.**

11 **Q.** Okay. But normal to low; correct?

12 **A. Yes.**

13 **Q.** You're also going to see typically normal  
14 or dilated pupils; correct?

15 **A. Yes. I'd say.**

16 **Q.** Okay. Can you tell the jury -- maybe  
17 they already know -- just so we're clear what  
18 "dilated" means.

19 **A. Just enlarged.**

20 **Q.** Okay. So normal is like you now.  
21 Dilated is big?

22 **A. Yeah.**

23 **Q.** And sometimes you're going to see  
24 respiratory failure; correct?

25 **A. Yes.**

1 Q. Respiratory failure, like coma, is also a  
2 late-stage finding?  
3 A. Yes.  
4 Q. Something you would expect to see further  
5 down in the end of the process than something  
6 earlier on?  
7 A. Yes.  
8 Q. Okay. I'm going to switch gears and talk  
9 to you about another medical condition. I'm going  
10 to talk to you about pesticide poisoning. Have you  
11 had any experience with that in your training or  
12 medical profession?  
13 A. I'm aware of it. I haven't seen cases  
14 that I can recall.  
15 Q. Okay. This is something you would have  
16 studied in medical school?  
17 A. Yes.  
18 Q. And something that you would have, I'm  
19 presuming, in continuing education?  
20 A. Yes.  
21 Q. Okay. You talked about miosis, or  
22 pinpoint pupils. Miosis and/or pinpoint pupils is  
23 something you would typically see -- I think I  
24 heard you earlier say you don't like to use the  
25 word "toxidrome"?

1 A. It's not something I use frequently.  
2 Q. Okay. That's fine. Some of your  
3 colleagues do, though; correct?  
4 A. Yes.  
5 Q. And could you tell the jury what a  
6 toxidrome is.  
7 A. I guess I would just say a toxic exposure  
8 or substance. It could be either oral or  
9 aerosolized or a lot of different ways. It's  
10 something that's caused a systemic response, I  
11 guess.  
12 Q. Okay. So it's, basically -- if I  
13 understand it correct, a toxidrome is like a  
14 constellation, a pattern, of signs and symptoms  
15 that indicate to you that somebody might have  
16 ingested a toxin. And those signs and symptoms  
17 could be specific to a particular toxin?  
18 A. Correct.  
19 Q. And we're going to go through the medical  
20 records and talk about the patients you saw. But  
21 all four of them presented with pinpoint pupils;  
22 correct?  
23 A. Yes.  
24 Q. And that pinpoint pupils was the red flag  
25 to you and the other doctors that something you

1 should look at as a possible toxin ingestion;  
2 correct?  
3 MS. DO: Your Honor, it's 12:00. Should we  
4 break now?  
5 THE COURT: Yes.  
6 We need to do that, ladies and gentlemen.  
7 Please be reassembled at 1:15. Take a bit of a  
8 short break today. 1:15. And we'll start as soon  
9 as we can after that.  
10 Again, remember the admonition. We'll be  
11 in recess. Thank you.  
12 (Recess.)  
13 THE COURT: The record will show the presence  
14 of the defendant, Mr. Ray; the attorneys, the jury.  
15 The witness, Dr. Cutshall, is on the stand.  
16 Ms. Do, you may continue.  
17 MS. DO: Thank you, Your Honor.  
18 Q. Good afternoon, Doctor. Before we broke  
19 for lunch, we were talking about pupils, dilated  
20 and pinpoint. And so that we are on the same  
21 page -- so dilated pupils, you said, were large;  
22 correct?  
23 A. Yes.  
24 Q. And pinpoint is small and constricted?  
25 A. Yes.

1 Q. Okay. So let me see if I can draw this.  
2 That's an eye. And this would be called the  
3 "iris"; right?  
4 A. The iris. Yes.  
5 Q. And then the pupils are in the iris. And  
6 so pinpoint is like that; correct?  
7 A. Yes.  
8 Q. And then dilated --  
9 Let me have you draw it, if you can. How  
10 big would the pupils be if they were dilated? I  
11 realize it's not to scale obviously.  
12 So almost taking up the full space of the  
13 iris; correct?  
14 A. Yes.  
15 Q. So there is no mistaking between the two?  
16 A. Correct.  
17 Q. That evening on October 8, 2009, all four  
18 of your patients came in with pinpoint pupils, as  
19 we see there?  
20 A. Yes.  
21 Q. And before we broke for lunch, you said  
22 that the pinpoint pupils were a red flag to you and  
23 the other doctors that you might possibly be  
24 dealing with a toxin or an ingestion of a toxin;  
25 correct?



1 **A. Yes.**  
 2 **Q.** We also talked about the word  
 3 "toxidrome." And you explained that. And I  
 4 understand it's not a word that you like to use. I  
 5 think you used the word "syndrome." Is that  
 6 correct?  
 7 **A. Toxidrome is fine.**  
 8 **Q.** Okay. I just don't want to use a word  
 9 that you're not comfortable with. Toxidrome is,  
 10 essentially, a pattern of signs and symptoms of a  
 11 particular toxin; correct?  
 12 **A. Yes.**  
 13 **Q.** And, if I understand correctly, there are  
 14 six basic toxidromes, to your knowledge. Correct?  
 15 **A. I guess I don't know of that**  
 16 **classification. But I don't know if that's**  
 17 **incorrect either.**  
 18 **Q.** Let's go through them and make sure that  
 19 we are on the same page. We've heard two so far on  
 20 your direct testimony. You talked about one called  
 21 an "anticholinergic"?  
 22 **A. Right.**  
 23 **Q.** Let me write that word so we all have the  
 24 same spelling.  
 25 Did I spell that right?

1 **A. Yes.**  
 2 **Q.** And the other one is called a  
 3 "cholinergic"; correct?  
 4 **A. Correct.**  
 5 **Q.** The other types of toxidromes that you  
 6 might come into -- encounter is called  
 7 "hallucinogenic" is one; correct?  
 8 **A. Yes.**  
 9 **Q.** Another one might be an opiate toxidrome?  
 10 **A. Yes.**  
 11 **Q.** Another one might be a sedative or  
 12 hypnotic type of toxidrome?  
 13 **A. Yes.**  
 14 **Q.** And the last one -- and I'm sure I'm  
 15 going to say this wrong. Sympathomimetic?  
 16 **A. Yeah. That's correct.**  
 17 **Q.** So did I get all six of the basic  
 18 toxidromes?  
 19 **A. Yes.**  
 20 **Q.** Now, I want to talk about the two that  
 21 have come up under your direct testimony. The  
 22 anticholinergic toxidrome. I understand there is a  
 23 phrase they teach in medical school to remember the  
 24 signs and symptoms of that particular toxidrome.  
 25 Do you know what I'm talking about?

1 **A. Oh, it includes mad as a hatter and all**  
 2 **these different things I don't remember.**  
 3 **Q.** Let me see if I got it right. Is it hot  
 4 as a hair? Dry as a bone? Red as a beet? Mad as  
 5 a hatter? Blind as a bat?  
 6 **A. Sounds right.**  
 7 **Q.** Okay. And that's what they teach you to  
 8 remember the signs and symptoms that would be a red  
 9 flag that you're dealing with an anticholinergic  
 10 toxidrome?  
 11 **A. Yes.**  
 12 **Q.** Okay. So with that particular toxidrome,  
 13 the first tell-tail sign is that you have a dilated  
 14 pupil; correct?  
 15 **A. That's right.**  
 16 **Q.** And it's the opposite of miosis? And I  
 17 think the word is "mydriasis"?  
 18 **A. Mydriasis.**  
 19 **Q.** There you go. So if you see dilated  
 20 pupils, you're going to think anticholinergic; is  
 21 that correct?  
 22 **A. Dilated could be cholinergic. No.**  
 23 **Anticholinergic. You're correct. Yes. Sorry.**  
 24 **Q.** That's okay. And another sign that you  
 25 might see, and this, I think, is under mad as a

1 hatter, is an altered mental status; correct?  
 2 **A. Yes.**  
 3 **Q.** That could include from delirium to coma?  
 4 **A. Correct.**  
 5 **Q.** You might even see seizures?  
 6 **A. Yes.**  
 7 **Q.** And dry as a bone means you would see dry  
 8 skin?  
 9 **A. And just dry mucosa if you took a look in**  
 10 **the mouth.**  
 11 **Q.** Okay. And you would also see rapid  
 12 heartbeat; correct?  
 13 **A. Yes.**  
 14 **Q.** That's what you called "tachycardia"?  
 15 **A. Yes.**  
 16 **Q.** And what are the causes of that  
 17 particular toxidrome, if you know?  
 18 **A. It's anticholinergic drugs. I don't have**  
 19 **a list off the top of my head. It's usually an**  
 20 **ingestion of a drug that has an anticholinergic**  
 21 **effect.**  
 22 **Q.** Okay. Is one of what you refer to -- and  
 23 we'll get to it -- in the medical records of Liz  
 24 Neuman, "datura" or "jimson weed"?  
 25 **A. We mentioned that as a possibility. At**

1 that point, again, we were just speculating on what  
2 might be contributing.

3 Q. Sure. And we'll get to that. I just  
4 want to understand what the causes are of an  
5 anticholinergic toxidrome. Could include something  
6 like jimson weed?

7 A. I'm not positive about jimson weed. That  
8 was mentioned in the initial history.

9 Q. Okay. What about antihistamines?

10 A. They do have anticholinergic effects as  
11 well.

12 Q. Atropine?

13 A. Atropine would be the opposite.

14 Q. But what distinguishes between  
15 anticholinergic and cholinergic are the eyes;  
16 correct?

17 A. Yes. They're opposite.

18 Q. Okay. So now let's talk about  
19 cholinergic. Pinpoint pupils; yes?

20 A. Yes.

21 Q. And I also understand that in medical  
22 school they teach you a mnemonic to remember the  
23 signs and symptoms of this particular toxidrome.  
24 And it's "SLUDGE" right?

25 A. Yes.

1 Q. Do you remember that?

2 A. I don't remember all of them.

3 Q. It's "SLUDGE" and something else called  
4 the "killer bees"? You remember that?

5 A. It's, basically, all the opposite of the  
6 bradycardia.

7 Q. Say that again.

8 A. It's the opposite of the anticholinergic.

9 Q. If you don't mind if we can talk through  
10 the signs and symptoms for a cholinergic toxidrome.  
11 The killer bees refer to bronchorrhea and  
12 bronchospasm, as I understand it. Is that correct?

13 A. Yes.

14 Q. And bronchorrhea. If you could tell the  
15 jury what that is, please.

16 A. It's just airway secretion, increased  
17 airway secretions.

18 Q. And what kinds of things would you see  
19 with that airway secretion?

20 A. Potentially kind of a gurgling with  
21 breathing, stuff like that.

22 Q. So, like, a watery, gurgling sound coming  
23 up in the breathing?

24 A. Yes.

25 Q. What about frothy sputum?

1 A. It would be -- similar kind of thing.

2 That same kind of sputum in the airway probably.

3 Q. Okay. So if I understand, bronchorrhea  
4 is excessive secretions from the bronchial mucosa  
5 of the lungs?

6 A. Yes.

7 Q. Resulting in copious production of either  
8 thin or frothy sputum? Is that correct?

9 A. Yes.

10 Q. So a layperson might see it as foaming?

11 A. Yes.

12 Q. Bronchospasm. Could you tell the jury  
13 what that is.

14 A. It's just constriction of the airways.

15 It would be bronchospasm seen with asthma. If you  
16 hear wheezing and stuff like that, it's  
17 bronchospasm.

18 Q. Okay. And as I understand, this  
19 particular toxidrome is referred to as the "killer  
20 bees" with bronchospasm because you have severe  
21 respiratory distress?

22 A. Yes.

23 Q. Respiratory failure?

24 A. You can. Yes.

25 Q. So in addition to the killer bees and

1 miosis, you would also have altered mental status?

2 A. You could. Yes.

3 Q. And we talked about SLUDGE, the mnemonic,  
4 S-L-U-D-G-E. Does "S" stands for salivation.

5 A. Yes.

6 Q. Lacrimation for the "L"?

7 A. Yes.

8 Q. Could you tell the jury what lacrimation  
9 is.

10 A. Tearing.

11 Q. So excessive tearing; correct?

12 A. Yes.

13 Q. And "U" stands for urination?

14 A. Yes.

15 Q. And "D" stands for diaphoresis?

16 A. Yes.

17 Q. Which is sweating?

18 A. Yes.

19 Q. The "G" stands for GI distress, the  
20 gastrointestinal area?

21 A. Yes.

22 Q. And the "E" emesis, e-m-e-s-i-s?

23 A. Yes.

24 Q. And that's?

25 A. Vomiting.

1 Q. Okay. With respect to cholinergic, you  
 2 stated earlier that you might see bradycardia;  
 3 correct?  
 4 A. Yes.  
 5 Q. And that's a slow heartbeat?  
 6 A. Yes.  
 7 Q. Do you know whether or not you can see  
 8 tachycardia?  
 9 A. Tachycardia would suggest  
 10 anticholinergic.  
 11 Q. Okay. Do you know, as you sit here now,  
 12 whether or not for certain you would not see  
 13 tachycardia in a cholinergic syndrome?  
 14 A. It's not part of the series of symptoms,  
 15 I guess.  
 16 Q. Okay. What about something called -- and  
 17 I'm sure I'm going to say this wrong.  
 18 Tachypnea (sic)? T-a-c-h-y-p-n-e-a.  
 19 A. Yeah. Tachypnea.  
 20 Q. Say that one more time.  
 21 A. Tachypnea.  
 22 Q. Yes. Will you see that with this  
 23 syndrome?  
 24 A. That's, again, just rapid breathing. If  
 25 you're having respiratory distress, you could.

1 Yes.  
 2 Q. Okay. Now, Mr. Hughes used the word or  
 3 we saw in the medical records. And he asked you  
 4 about cholinergic toxidromes. Can you tell the  
 5 jury what the causes are of that toxidrome.  
 6 A. Again, typically drug ingestions would do  
 7 that. I don't have the -- mentioned antihistamine,  
 8 anticholinergic. I don't have the lists in front  
 9 of me of all the drugs.  
 10 Q. You didn't know you were going to get  
 11 quizzed on this?  
 12 A. It's a pretty broad quizzing today.  
 13 Q. Sorry. One of the causes of cholinergic  
 14 toxidromes is organophosphates; correct?  
 15 A. Yes.  
 16 Q. Pesticides like carbamates?  
 17 A. Yes.  
 18 Q. A typical cause for cholinergic  
 19 toxidromes is ingestion or exposure to  
 20 organophosphates or another pesticide; is that  
 21 correct?  
 22 A. Yes.  
 23 Q. I understand from your earlier testimony  
 24 before we broke for lunch that you haven't seen a  
 25 case of this but you have either studied it in

1 medical school or seen it in your continuing  
 2 education?  
 3 A. Correct.  
 4 Q. Could you tell the jury whether or not  
 5 organophosphates is toxic to the human body.  
 6 A. It is.  
 7 Q. It's really toxic, isn't it?  
 8 A. Depending on the degree of exposure, yes.  
 9 It can be very toxic.  
 10 Q. Okay. Do you know whether or not  
 11 organophosphates is the most widely used pesticide  
 12 today?  
 13 A. I don't know if it's the most widely  
 14 used, but it's commonly used. I know that.  
 15 Q. Okay. Commonly used. And some of the  
 16 forms of the organophosphates will come in as  
 17 spray?  
 18 A. Yes.  
 19 Q. You use it to spray perhaps the ground to  
 20 rid of pesticide; correct?  
 21 A. Yes.  
 22 Q. And I understand the origin of  
 23 organophosphates was back in wartime it was  
 24 actually developed as a nerve gas. Do you know  
 25 that?

1 A. Yes.  
 2 Q. It is?  
 3 A. Yes. I believe so. Yes.  
 4 Q. Okay. Could you tell the jury how it is  
 5 that this compound that is toxic to the body  
 6 affects the body.  
 7 A. Similar to some of the things we've just  
 8 been talking about -- nausea, vomiting, diarrhea,  
 9 small pupils, bradycardia, salivation, sweating.  
 10 Q. Okay. And if I understand it correctly,  
 11 the compound inhibits a nervous system enzyme.  
 12 Correct?  
 13 A. Yes.  
 14 Q. And by inhibiting that enzyme you see  
 15 serious effects on the respiratory system?  
 16 A. Yes.  
 17 Q. Serious effect on the heart?  
 18 A. I'd say generalized muscle weakness and  
 19 affects breathing and diaphragm, can affect the  
 20 heart.  
 21 Q. So muscle functions?  
 22 A. Yes.  
 23 Q. I want to talk to you a little bit about  
 24 exposure rate, and then we're going to move into  
 25 your medical records.

1 You can have exposure to organophosphates  
 2 by ingesting it correct?  
 3 **A. Yes.**  
 4 **Q.** You can have exposure by inhalation,  
 5 meaning somehow it's been aerosolized and it's in  
 6 the air; correct?  
 7 **A. Yes.**  
 8 **Q.** You can also have it absorbed through the  
 9 skin; correct?  
 10 **A. Yes.**  
 11 **Q.** Dermal absorption?  
 12 **A. Yes.**  
 13 **Q.** Do you know whether or not you can absorb  
 14 organophosphates or pesticides quicker if you have  
 15 hot, sweaty skin as opposed to cool skin?  
 16 **A. Be quicker with hot skin.**  
 17 **Q.** Okay. So if you had an environment where  
 18 you had heat, it actually is much more conducive to  
 19 absorption of organophosphates; correct?  
 20 **A. Yes.**  
 21 **Q.** Do you know whether or not there are  
 22 different absorption rates for different parts of  
 23 the body?  
 24 **A. Suspect there are, but I don't know the**  
 25 **details on that.**

1 **Q.** That's okay. I'm not going to ask you  
 2 about that. Do you suspect that, for example, you  
 3 might absorb it faster through the -- and this is  
 4 dermal absorption -- through the skin of the  
 5 stomach as opposed to the palm; correct?  
 6 **A. Yeah. I think the thickness of the**  
 7 **dermis in the skin would make a difference.**  
 8 **Q.** Okay. Treatment of this particular  
 9 poison -- in most cases a poison, Doctor, is it  
 10 true that there are very few antidotes?  
 11 **A. I don't know if there is very few, but**  
 12 **there is antidotes to some things.**  
 13 **Q.** Okay. In addition to if there is an  
 14 antidote available, if you are a victim of  
 15 poisoning, oftentimes the amount of your body  
 16 dealing with it, and it's either going to rid it or  
 17 it's not; is that correct?  
 18 **A. Sometimes the antidotes control symptoms**  
 19 **themselves. It doesn't completely get rid of it.**  
 20 **I don't know if it's that straightforward.**  
 21 **Q.** Okay. But I guess what I'm trying to  
 22 understand is in addition to perhaps drugs or an  
 23 antidote that will help deal with the various  
 24 symptoms or the problem, your body is either going  
 25 to get rid of it or not; is that correct?

1 **A. I don't understand that question.**  
 2 **Q.** Let me just ask you open ended. How does  
 3 a person get past a toxic exposure?  
 4 **A. I think in time they will clear it -- you**  
 5 **know -- either renally or through -- hepatic**  
 6 **metabolism through the liver or renal metabolism**  
 7 **through the kidney.**  
 8 **So while the body will actively clear it**  
 9 **eventually, it's a matter of treating the symptoms**  
 10 **that are happening acutely.**  
 11 **Q.** Okay. And if the exposure is great, the  
 12 chances of your body clearing is reduced?  
 13 **A. If the levels are higher, it takes longer**  
 14 **to clear, longer period of symptoms.**  
 15 **Q.** And greater effect on the body; correct?  
 16 **A. Yes.**  
 17 **Q.** With the case of a cholinergic toxidrome  
 18 caused by organophosphates, I understand that there  
 19 are two drugs used to treat. One is atropine and  
 20 the other is tropan; correct?  
 21 **A. Yes.**  
 22 **Q.** And atropine is something that is used to  
 23 resuscitate the heart; correct?  
 24 **A. It has effects on the heart. It is used**  
 25 **in algorithms for cardiac life support.**

1 **Q.** We talked earlier sort of at the  
 2 beginning of our conversation about differential  
 3 diagnoses. Do you recall that?  
 4 **A. Yes.**  
 5 **Q.** And we talked about the various signs and  
 6 symptoms of heat exhaustion that then evolve into  
 7 heat stroke. When you have a cholinergic toxidrome  
 8 that could be caused by organophosphates or  
 9 pesticides, you're going to see fatigue and  
 10 weakness in some cases; right?  
 11 **A. Yes.**  
 12 **Q.** And in some cases you will also see  
 13 malaise?  
 14 **A. I think you can see that. As you kind of**  
 15 **said with the algorithms too, it's not part of the**  
 16 **toxidrome. It's more of a nonspecific finding. I**  
 17 **think it can be associated with it.**  
 18 **Q.** Okay. Associated with it. Nausea and  
 19 vomiting and abdominal cramps?  
 20 **A. Yes.**  
 21 **Q.** Vertigo and dizziness as sort of part of  
 22 the altered mental status?  
 23 **A. I think it can be seen. But, again,**  
 24 **that's not -- there is kind of parts of these that**  
 25 **are directly part of the toxidrome and parts that**

1 aren't.

2 Q. And let me clarify based on your answer.  
3 We are not suggesting to the jury that in the case  
4 of heat exhaustion -- well, let me say this: In  
5 the case of an organophosphate poisoning that you  
6 would see all of these things; correct?

7 A. Yeah.

8 Q. You may see it associated in some cases  
9 and other cases not?

10 A. I think you may see that, but it's not  
11 classic. Nausea, vomiting, is part of the  
12 toxidrome. Some of them more so than others.

13 Q. Is that the -- which was the "G" in  
14 SLUDGE, the gastrointestinal distress?

15 A. The emesis.

16 Q. The emesis. Vertigo and dizziness?

17 A. Can be seen.

18 Q. Headache?

19 A. It's nonspecific, but yes. Probably.

20 Q. Okay. And when you say "nonspecific,"  
21 it's nonspecific for both heat exhaustion as well  
22 as OPs?

23 A. You kind of asked the specific questions  
24 of the toxidrome. Those are more along these  
25 mnemonics that you used. That's not part of the

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1 mnemonic. But it doesn't mean you couldn't see it  
2 with it.

3 Q. Okay.

4 A. Just seems like we're making a  
5 distinction here of what's the toxidrome and what  
6 isn't. And some of these aren't and some are. A  
7 large number of these are nonspecific findings that  
8 could be seen associated with that, I would say.

9 Q. Okay. You are the --

10 A. Not part of the toxidrome.

11 Q. Got it. You're the expert. I want to  
12 try and understand correctly. When they talk about  
13 SLUDGE, the S-L-U-D-G-E, those are sort of classic  
14 presentations of the toxidrome?

15 A. Yeah.

16 Q. And some of these particular signs and  
17 symptoms may not be classic but they could be  
18 associated. Did I get that right?

19 A. Yes.

20 Q. Okay. So headache is something that you  
21 would see associated in some cases?

22 A. Could be. Yes.

23 Q. Okay. What about muscle cramps and  
24 twitching?

25 A. Yes. I'd say so.

1 Q. Okay. What about dehydration? Are you  
2 going to see that in a case of OP poisoning? And  
3 when I say "OP," we're talking about  
4 organophosphates.

5 A. I think you can secondarily with the  
6 sweating, and all these other things associated can  
7 lead to dehydration to an extent as well.

8 Q. Okay.

9 A. But the sweating and the presentation is  
10 more of a wet appearance, as they would say, with  
11 excessive salivation and moisture rather than dry.

12 Q. Okay. And that goes back to the  
13 hypersecretion that you would see under the  
14 toxidrome; correct?

15 A. Yes.

16 Q. As opposed to dry skin, dry mucosa, you  
17 would see clammy skin?

18 A. Right.

19 Q. Or poor extremities?

20 A. And salivation instead of a dry mouth.  
21 It's the opposite.

22 Q. Okay. And the frothy sputum?

23 A. Right.

24 Q. Okay. Altered mental status. We've  
25 already covered that. You're going to see that;

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1 right? That's mad as a hatter?

2 A. Yes.

3 Q. And temperature?

4 A. I don't know that there is specific  
5 relation with the temperature. I think it can be a  
6 little bit elevated, but that's not classic.

7 Q. Okay. But if you see 104, 105, 106, as a  
8 doctor, you're going to think heat stroke?

9 A. I would say heat stroke --

10 Q. I'm sorry. I don't mean to confuse you.  
11 If you see a patient with 104, 105, you would think  
12 heat stroke; correct?

13 A. That's on a differential for that.

14 Q. Okay. But you're not necessarily going  
15 to look for elevated temperature to this threshold  
16 in the case of OP poisoning; correct?

17 A. Right.

18 Q. I'm going to skip over that. Metabolic  
19 acidosis. We talked about that earlier. And you  
20 said it was a nonspecific finding, meaning you can  
21 have it in heat stroke or in other cases caused by  
22 other things; correct?

23 A. Yes.

24 Q. So you can see metabolic acidosis in a  
25 case of OP poisoning?

- 1 **A. You could.**
- 2 **Q.** The muscle breakdown, the
- 3 rhabdomyolysis -- you also indicated that is not
- 4 specific to heat stroke? You can see it in the
- 5 case of OP poisoning; correct?
- 6 **A. Not directly. But if you were in a coma**
- 7 **or for other reasons you were immobile, yes.**
- 8 **Q.** Okay. So if a patient is down, as you
- 9 said earlier, for some time, meaning they're
- 10 unresponsive, they're in a comatose stage, that
- 11 particular condition can lead to a muscle
- 12 breakdown?
- 13 **A. Yes.**
- 14 **Q.** If the person is presented with a
- 15 toxidrome and they're unresponsive, they're down
- 16 and comatose, you could have muscle breakdown?
- 17 **A. Yes.**
- 18 **Q.** Because of the muscle breakdown, you
- 19 could see elevated creatinine also in the case of
- 20 OP poisoning; correct?
- 21 **A. The creatinine is more the renal**
- 22 **function. So they're not, again, directly related.**
- 23 **If it's the dehydration, again, just indirectly.**
- 24 **Yes.**
- 25 **Q.** Okay. And then because of the elevated

- 1 creatinine, you could also see acute renal failure
- 2 in the case of OP poisoning; correct?
- 3 **A. Indirectly.**
- 4 **Q.** When you say "indirectly," you're talking
- 5 about, like, complications?
- 6 **A. Essentially, we're talking about the end**
- 7 **of the spectrum and you're starting to describe**
- 8 **laboratory values and end-organ failure. So if you**
- 9 **start having end-organ failure for any reason, you**
- 10 **can start seeing this.**
- 11 **Q.** Okay.
- 12 **A. There are things that are directly toxic**
- 13 **to the kidneys that can cause those**
- 14 **straightforward, and that's not really the case in**
- 15 **this situation.**
- 16 **Q.** Okay. You also talked about DIC, the
- 17 disseminated inter --
- 18 **A. Intervascular coagulation.**
- 19 **Q.** Yes. Now, we talked about that as not
- 20 being specific to heat stroke. You could see that
- 21 in a critically ill patient that's been exposed to
- 22 toxins; correct?
- 23 **A. I'd say it's not real well documented**
- 24 **with the evidence. If they were critically ill**
- 25 **potentially.**

- 1 **Q.** Now, the tachycardia, the fast heart
- 2 rate, you indicated -- I just want to make sure I
- 3 understand you correctly -- that you -- would you
- 4 see tachycardia, fast heart rate, in the case of a
- 5 cholinergic toxidrome?
- 6 **A. Cholinergics?**
- 7 **Q.** Yes.
- 8 **A. Should be bradycardia.**
- 9 **Q.** Should be bradycardia. Do you know
- 10 whether or not it could also include tachycardia?
- 11 **A. You mean they're opposites. So if it's**
- 12 **turning towards -- I think you'd say normal or**
- 13 **bradycardia, not go to the opposite end of the**
- 14 **spectrum.**
- 15 **Q.** Okay. And I don't mean to test you on
- 16 this. But let me ask you this: We don't need to
- 17 go too far into the details here. When you have an
- 18 organophosphate poisoning, we talked about how that
- 19 compound, essentially, inhibits a nervous enzyme;
- 20 correct? Nervous system enzyme?
- 21 **A. Yes.**
- 22 **Q.** And there are two kinds of effects.
- 23 There is a nicotinic and muscarinic effect;
- 24 correct?
- 25 **A. Yes.**

- 1 **Q.** So in the case of -- I believe in the
- 2 case of a muscarinic effect, you might see
- 3 bradycardia; correct?
- 4 **A. Yes.**
- 5 **Q.** If it has more of a nicotinic effect,
- 6 you're going to see tachycardia?
- 7 **A. That's true.**
- 8 **Q.** So it depends on which particular -- and
- 9 when we say "muscarinic" and "nicotinic," we're
- 10 talking about receptors; correct?
- 11 **A. Yes.**
- 12 **Q.** And so it depends on which one of those
- 13 receptors the OP compound is activating more;
- 14 correct?
- 15 **A. Probably depends more on which**
- 16 **organophosphate. Yeah.**
- 17 **Q.** Do you know how many organophosphates
- 18 there are?
- 19 **A. No.**
- 20 **Q.** Okay. So when you said you would expect
- 21 to see bradycardia, the slow heart rate -- let me
- 22 make sure I write that over here -- that's if you
- 23 have the compound affecting more of the muscarinic
- 24 receptors; correct?
- 25 **A. Yes.**

1 Q. But if it isn't, you would have  
2 tachycardia?  
3 A. Yes. But if it's nicotinic, you could  
4 have tachycardia.  
5 Q. So I just want to be sure we're speaking  
6 the same language and the jury understands it.  
7 When you have an OP poisoning, the fact that there  
8 is no bradycardia doesn't mean that's not what's  
9 going on. It just means the OP is interacting more  
10 with the other receptors. Is that correct?  
11 A. Yes. I guess it's hard to say for  
12 sure -- if there is a nicotinic and muscarinic  
13 response, it can affect both. And they're  
14 opposite.  
15 Q. Okay. So you can see either/or?  
16 A. Yes.  
17 Q. Okay. With respect to the blood  
18 pressure, we already talked about heat stroke. You  
19 would see normal to low, but in the case of OP  
20 poisoning you would actually see normal to high;  
21 correct?  
22 A. For blood pressure?  
23 Q. Yes.  
24 A. Again, it would probably make some  
25 difference on whether it's muscarinic or nicotinic.

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1 But yes.  
2 Q. Okay. You're going to see more normal to  
3 high? I don't want to put words in your mouth. I  
4 want to make sure we got this right.  
5 A. Normal to high would be with a nicotinic  
6 receptor. A muscarinic receptor, if he had  
7 bradycardia, it would be doing the opposite.  
8 Q. Okay.  
9 A. So it would be normal to low, potentially  
10 low, with bradycardia.  
11 Q. Okay. And then with respect to the  
12 pupils -- we talked about this already -- you're  
13 going to see pinpoint pupils; correct?  
14 A. Yes.  
15 Q. You're also going to see respiratory  
16 failure in a case of OP poisoning because of the  
17 killer bees that we talked about; correct?  
18 A. You can see that. Yes.  
19 Q. And bronchorrhea and bronchospasm;  
20 correct?  
21 A. Yes.  
22 Q. And under that you're going to see things  
23 like frothy sputum; correct?  
24 A. Yes.  
25 Q. Which a layperson would know as foaming?

1 A. Yes.  
2 Q. You're going to see excessive salivation;  
3 correct?  
4 A. Yes.  
5 Q. You're going to see cool or clammy skin;  
6 correct?  
7 A. Yes.  
8 Q. Okay. Would you agree with me, Doctor,  
9 that the signs and symptoms of heat stress  
10 oftentimes mimic the signs and symptoms of a  
11 cholinergic toxidrome?  
12 A. Some of them. Yes.  
13 Q. Okay. And are you familiar with, for  
14 example, because it mimics some of them, some of  
15 the ones we've gone through, farm workers, for  
16 example, are exposed to both heat and pesticides.  
17 Are you familiar with whether or not they  
18 are and people who work with them are warned that  
19 sometimes pesticides can mimic heat stress and heat  
20 stress can sometimes mimic pesticides?  
21 A. I think it would complicate things if you  
22 were working with pesticides.  
23 Q. Say that one more time.  
24 A. It would complicate things if you were  
25 working with pesticides in the heat.

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1 Q. Why would it complicate things?  
2 A. Because there is two factors. And there  
3 is some overlapping symptoms.  
4 Q. Okay. So there is symptoms that mirror  
5 each other; correct?  
6 A. Yes.  
7 Q. And they can oftentimes be confusing and  
8 challenging to sort out; correct?  
9 A. Yes.  
10 Q. We had talked about very early on how you  
11 had limited information when all these folks came  
12 in critically ill. And that information was  
13 hearsay that you got from the EMS folks who had  
14 gone out to the scene; correct?  
15 A. Yes.  
16 Q. And you had -- I think, common sense told  
17 the jury that more information would have been  
18 helpful to you; correct?  
19 A. Yes.  
20 Q. During the nine days that you had cared  
21 for Liz Neuman, from October 8 to the 17th, did  
22 anyone from the Yavapai County Sheriff's Office  
23 contact you to offer you information that they  
24 might have learned in their investigation?  
25 A. No.

1 Q. Were you ever told during those nine days  
2 that you cared for Liz Neuman that a first  
3 responder at the scene on October 8, 2009, had  
4 suspected organophosphates?

5 A. No.

6 Q. And I understand that you met with  
7 Mr. Hughes about a month ago. Is that correct?

8 A. Yes.

9 Q. And in that meeting with Mr. Hughes --  
10 and my understanding is that was not recorded in  
11 any way. Do you know?

12 A. I don't believe so.

13 Q. In that meeting with Mr. Hughes, did he  
14 ever tell you that there was evidence, a  
15 tape-recording in this case, that a first responder  
16 on October 8, 2009, suspected organophosphates?

17 A. No. Qualify one thing. I was only on  
18 service -- I wasn't on service for seven of those  
19 days in the middle. I can't tell you that none of  
20 my partners were contacted. I don't know.

21 Q. Okay. Thank you for that clarification.  
22 For the first two days and the last day when she  
23 expired?

24 A. When I was there, no.

25 Q. Were you ever told that the Yavapai

1 County Sheriff's Office and the medical examiner's  
2 office in this case considered testing the soil  
3 underneath the patients, the decedents?

4 A. No.

5 Q. And now I really want you to -- I want to  
6 make sure this is clear. I'm not in any way second  
7 guessing the care you gave to Ms. Neuman. I  
8 understand you did the best job you could based on  
9 the information you had. Correct?

10 A. Yes.

11 Q. If at the time that you were caring for  
12 Ms. Neuman someone came in and said there is a  
13 statement by a first responder of October 8, 2009,  
14 that they suspected organophosphates, would that  
15 information have been helpful to you?

16 A. It would have been nice to know. I don't  
17 know that it would have changed what I did.

18 Q. Sure. But it would have helped you  
19 because, as we're going to talk about some more,  
20 you're trying to figure out what toxidrome you  
21 might be dealing with. That information could have  
22 been helpful; correct?

23 A. Yes.

24 Q. If someone had come to you during those  
25 nine days or to one of your colleagues and said

1 somebody suspected organophosphates, while I  
2 understand you have to care for Ms. Neuman and the  
3 other patients and you might not have the luxury of  
4 getting the tests back immediately, you could have  
5 at that point saved a fresh sample of blood and  
6 turned that over to the sheriffs for testing;  
7 correct?

8 A. Could have done a sample for legal  
9 reasons. I don't know that it would have affected  
10 medical care at that point. So unless there was a  
11 legal reason to do something, we would not.

12 Q. And I understand. Thank you for the  
13 clarification. Not at all suggesting that it would  
14 have changed what you did for Ms. Neuman.

15 My question is you could have preserved a  
16 sample of Ms. Neuman's fresh blood or any one of  
17 the other patients, and that could have been tested  
18 for the presence or the absence of  
19 organophosphates; correct?

20 A. Yes.

21 Q. And do you know whether or not testing of  
22 organophosphates require an immediate, fresh sample  
23 of blood?

24 A. I'm not sure about the details on that.

25 Q. Okay. So you don't know one way or

1 another if you can test it 17 months later and  
2 expect to find it; correct?

3 A. I'm not sure about that.

4 Q. Okay. While you were caring for  
5 Ms. Neuman during those nine days and the other  
6 folks -- and, again, not suggesting it would change  
7 your care -- did anyone from the sheriff's office  
8 tell you that the folks who heated the rocks used  
9 in the ceremony on October 8, 2009, said they  
10 believed they burned the wrong wood?

11 A. No.

12 Q. Okay. No one told you that there was a  
13 statement by the people who heated the rocks that  
14 very night that they may have burned treated wood;  
15 is that correct?

16 A. No. I didn't hear that.

17 Q. Did anyone ever tell you during the time  
18 that you had these patients in your care that there  
19 was a statement by these same people that some of  
20 the materials used in the sweat lodge had been  
21 stored with rat poison?

22 A. I was not told that.

23 Q. Okay. Now, again, Doctor, I'm not  
24 suggesting, one, this would have changed your care.  
25 Okay? And I'm also not suggesting to you that this



1 is what caused their illnesses.

2 But as you told the jury earlier, more  
3 information is always better; correct?

4 **A. Yes.**

5 **Q.** Were you ever told by anyone either from  
6 the sheriff's office or the county attorney's  
7 office that interviews conducted of the witnesses  
8 at the scene on October 8 had seen at least six  
9 people foaming at the mouth?

10 **A. No.**

11 **Q.** So you were never told that witnesses at  
12 the scene saw Kirby Brown, one of the decedents,  
13 foaming at the mouth?

14 **A. No.**

15 **Q.** Or that she had watery, gurgling sounds  
16 coming up through her airway?

17 **A. I was not told that.**

18 **Q.** You were also not every told that James  
19 Shore, the other decedent, was seen by witnesses on  
20 October 8 with the same frothy sputum or foaming  
21 from the mouth; correct?

22 **A. Correct.**

23 **Q.** Liz Neuman was your patient. Did anyone  
24 ever tell you that witnesses at the scene on  
25 October 8, 2009, saw Ms. Neuman foaming at the

1 mouth?

2 **A. No.**

3 **Q.** Did anyone ever tell that you Stephen  
4 Ray, the other critically ill patient who came into  
5 your care or your colleagues' care, also had frothy  
6 sputum or foaming at the mouth?

7 **A. I did not hear that. No.**

8 **Q.** Same is true for Tess Wong?

9 **A. Yes.**

10 **Q.** Same is true for Sidney Spencer?

11 **A. Yes.**

12 **Q.** Now, that's critical information, isn't  
13 it, Doctor, that you got six people, three of whom  
14 died, three who were critically ill, all frothy  
15 sputum and foaming at the scene; correct?

16 **A. Yes.**

17 **Q.** That would have been information that  
18 would have been helpful to you and to your  
19 colleagues when you all got together trying to  
20 figure out what happened to these folks and how we  
21 can care for them; correct?

22 **A. Yes. I guess, again, I qualify, though,**  
23 **that we always get a lot of pieces of information.**  
24 **And knowing the reliability and how much to act on**  
25 **any piece is hard to focus on that. So knowing**

1 **that too, if there was a hearsay about foaming in**  
2 **the mouth is helpful to know, but is a big piece of**  
3 **the puzzle too.**

4 **Q.** And it was a puzzle, wasn't it?

5 **A. Yeah. It's one element. Again, you want**  
6 **to put all the elements together and come up with**  
7 **an answer. But hearing another element doesn't**  
8 **always clarify the situation.**

9 **Q.** It may or may not?

10 **A. Yeah.**

11 **Q.** But it would have been something you  
12 could have discussed with the other doctors;  
13 correct?

14 **A. Yeah. I mean, it's helpful to hear as**  
15 **much information as we can.**

16 **Q.** I know that you did not speak to -- speak  
17 directly with any of the doctors from the other  
18 hospitals -- Verde Valley or Sedona. You also  
19 indicated you did not speak to anyone from the  
20 sheriffs or the county attorneys.

21 Did anyone ever tell you that the  
22 diagnostic evaluations and the lab workups of  
23 everyone else at the other two hospitals showed a  
24 pattern of either normal to mild dehydration?

25 **A. Like I said, I didn't hear the details on**

1 **other patients.**

2 **Q.** Did anyone ever tell you that the  
3 diagnostic evaluations and the lab workups of  
4 everyone else who went to the other hospitals  
5 showed a pattern of below to mildly elevated  
6 temperatures?

7 **A. No.**

8 **Q.** Did you know that Liz Neuman, your  
9 patient, recorded the highest temperature in this  
10 case, that being of 101.7?

11 **A. I knew her temperature. I didn't know**  
12 **the comparison because I didn't know the others.**

13 **Q.** Okay. But you didn't know that anyone  
14 else even broke that 104 that we talked about;  
15 correct?

16 **A. Correct.**

17 **Q.** Mr. Hughes talked to you a little bit  
18 about dehydration and rehydration and cooling. Did  
19 anyone tell you that Kirby Brown and James Shore  
20 were asystolic at the scene?

21 **A. I heard there was fatalities at the**  
22 **scene, but I didn't know the details.**

23 **Q.** And asystolic, for the jury, is where  
24 your heart has stopped; correct?

25 **A. No pulse.**

1 Q. So with no heart activity, circulation is  
2 not happening; correct?

3 A. Correct.

4 Q. So if you have an asystolic person with  
5 no heart activity, no circulation, no amount of  
6 I.V. fluid is going to rehydrate that person;  
7 correct?

8 A. **There are times when you get back into a**  
9 **regular rhythm after that. So under those -- you**  
10 **need to restore regular heart rhythm. If it stays**  
11 **asystolic, there is no perfusion at that point.**

12 Q. Okay. So let me try to sort that out.  
13 If someone is asystolic, meaning their heart has  
14 stopped, and you can get rhythm going again,  
15 meaning --

16 A. **You can do CPR and temporarily bridge**  
17 **them and get a rhythm back, you can revive them at**  
18 **that point. If you never get a rhythm from**  
19 **asystole, they're dead.**

20 Q. Which means you can't rehydrate them;  
21 correct?

22 A. **It wouldn't save them at that point. You**  
23 **need to reestablish the rhythm first.**

24 Q. Okay. I understand that. Let me ask you  
25 this question, and maybe that will make sense: Did

1 anyone every tell you that the vitreous fluid  
2 testing at autopsy of Kirby Brown and James Shore  
3 came back with clinical diagnostic evidence that  
4 they were not dehydrated?

5 A. **No. I didn't hear that information.**

6 Q. Okay. And so let me work that back a  
7 little bit. If Kirby Brown and James Shore,  
8 according to EMS or a participant who is a doctor,  
9 says she was asystolic and never resuscitated, even  
10 if you put an I.V. in her, it's not going to  
11 rehydrate her; correct?

12 A. **The bottom line, you can't resuscitate**  
13 **someone who is dead.**

14 Q. I'm sorry?

15 A. **You can't resuscitate someone that's**  
16 **dead. If they're asystolic and they have no**  
17 **heartbeat, they can't be resuscitated.**

18 Q. The facts of it -- and you know what  
19 vitreous fluid is; right?

20 A. **From the eye.**

21 Q. It's the fluid from the eye?

22 A. Yes.

23 Q. And it's used as a gold standard to test  
24 in autopsy whether or not someone is dehydrated or  
25 not; correct?

1 A. Yes.

2 Q. And in this case no one ever told you  
3 that Kirby Brown and James Shore both showed under  
4 this gold standard that they were not dehydrated?

5 A. No.

6 Q. Again, if you were given all this  
7 information that we just talked about, not  
8 suggesting that it would have affected your care,  
9 because at this point you're worried about the  
10 end-organ failure in Ms. Neuman; correct?

11 A. Yes.

12 Q. Not suggested that it would have affected  
13 your care, but this would have been information  
14 that you and the other doctors could have fit into  
15 the puzzle you were seeing that night; correct?

16 A. **Yes. The role for it would have been**  
17 **whether or not to give an antidote immediately.**  
18 **Otherwise the supportive care would have been**  
19 **exactly the same. Even finding this information**  
20 **several hours later would probably be too late to**  
21 **be doing much for antidotes.**

22 **So it really wouldn't have changed what**  
23 **we were doing much. It's nice to know that**  
24 **information, but it wouldn't have changed how we**  
25 **were approaching things. Regardless of what the**

1 **cause is of the kidney failure and the respiratory**  
2 **failure, that all needs to be addressed and**  
3 **stabilized. There gets to be a certain point where**  
4 **it didn't really matter why -- how it happened. It**  
5 **becomes how severe is the injury.**

6 Q. Okay. Understood. And so if I can  
7 repeat that to make sure I understand it correctly.  
8 What you're saying is that if you had gotten that  
9 information within a critical time period, you  
10 could have given an antidote?

11 A. **Could have been considered. That would**  
12 **have been the consideration and the real value, I**  
13 **think, of getting it quickly.**

14 Q. Okay. But Ms. Neuman at some point  
15 reached a stage where what you're concerned with is  
16 managing her care, and an antidote wouldn't have  
17 made a difference; correct?

18 A. Correct.

19 Q. At this point I'd like to move into the  
20 specifics of your finding in the medical records.

21 A. Okay.

22 Q. Let's talk about Ms. Neuman. And I put  
23 all the medical records in front of you. Were you  
24 aware in this case that 9-1-1 -- the first 9-1-1  
25 call was made at 5:19 p.m.?

1 **A. I didn't know the exact time.**  
 2 **Q.** Okay. Give me one second.  
 3 Your Honor, at this time the state and  
 4 the defense agree to exhibits 133 and 134.  
 5 THE COURT: 133 and thirty-four are admitted.  
 6 (Exhibits 133 and 134 admitted.)  
 7 MS. DO: May I approach the witness?  
 8 THE COURT: Yes.  
 9 **Q.** BY MS. DO: Doctor, I'm going to show you  
 10 what has been marked and moved into evidence as  
 11 Exhibit 134.  
 12 MS. DO: May I publish?  
 13 THE COURT: Yes.  
 14 **Q.** BY MS. DO: You would agree with me that  
 15 this is a record from Sedona Fire District?  
 16 **A. Yes.**  
 17 **Q.** And that this particular record obtained  
 18 from the fire district shows the first 9-1-1 call  
 19 being made at 5:19; correct?  
 20 **A. Yes.**  
 21 **Q.** Okay. I'd like you to take a look at  
 22 Exhibit 369. I'm sorry. Excuse me.  
 23 Your Honor, Mr. Hughes has kindly agreed  
 24 to moving into evidence Exhibit 369.  
 25 THE COURT: 369 is admitted.

1 (Exhibit 369 admitted.)  
 2 **Q.** BY MS. DO: I'm going to put this in  
 3 front of you, Doctor. Mr. Hughes earlier showed  
 4 you 791, which is the exact same copy. But this is  
 5 the one I looked at. You recognize that to be the  
 6 records from Guardian Air?  
 7 **A. Yes.**  
 8 **Q.** And that is the helicopter service that  
 9 flew Ms. Neuman to Flagstaff medical; correct?  
 10 **A. Correct.**  
 11 **Q.** And I'm going to ask you to look at the  
 12 second page. Excuse me. The second page, which is  
 13 Bates stamped on your copy as 2594.  
 14 **A. Okay.**  
 15 **Q.** And I'd like you to tell me whether or  
 16 not you see on that page comments by the paramedic  
 17 that Ms. Neuman's extremities were at the time that  
 18 he saw her cool to the touch and slightly dusky?  
 19 **A. Says they were clammy, cold and cyanotic.**  
 20 **Q.** Okay. You're skipping ahead of me.  
 21 We'll get there. Right above you see the comments,  
 22 extremities cool to the touch?  
 23 **A. Yes.**  
 24 **Q.** Is that correct?  
 25 **A. Yes.**

1 **Q.** And if you turn to the first page, you  
 2 see the time on the right hand regarding when they  
 3 arrived, when they were at Liz Neuman; correct?  
 4 **A. Says 1817 was the time at the patient.**  
 5 **Q.** Okay. And that would be 6:17 p.m.;  
 6 correct?  
 7 **A. Correct.**  
 8 **Q.** Going back to page 2, you had indicated  
 9 in addition to what I had highlighted, extremities  
 10 cool to the touch, that at the bottom of that  
 11 comments the EMS at 6:17 noted that her skin was  
 12 clammy and cold; correct?  
 13 **A. Yes.**  
 14 **Q.** And we had talked about this earlier with  
 15 regards to the signs that you would see under  
 16 killer bees of a toxidrome, a cholinergic  
 17 toxidrome, that you would see cool and clammy;  
 18 correct?  
 19 **A. Yes.**  
 20 **Q.** At the time you treated Ms. Neuman, did  
 21 you have the benefit of looking at this record?  
 22 **A. I didn't see this record at this time.**  
 23 **No.**  
 24 **Q.** The other thing on this particular page,  
 25 if you look down to where the EMS or the paramedic

1 noted findings on breathing, he wrote -- if you  
 2 could read that word for me.  
 3 **A. Is that in the same area there?**  
 4 **Q.** Do you see the word that's up on the  
 5 screen now?  
 6 **A. Tachypnea.**  
 7 **Q.** That's something that we talked about  
 8 earlier. Fast and also deep breathing; correct?  
 9 **A. Yes.**  
 10 **Q.** That is something you might encounter  
 11 with a cholinergic syndrome; correct?  
 12 **A. Yes.**  
 13 **Q.** Now, when paramedics arrive to a patient,  
 14 in some instances they do take temperature. Do you  
 15 see the temperature that was taken of Ms. Neuman on  
 16 page 3?  
 17 **A. 97.5.**  
 18 **Q.** And that's an axillary temperature;  
 19 correct?  
 20 **A. Yes.**  
 21 **Q.** Could you tell the jury what an axillary  
 22 temperature is.  
 23 **A. Taken in the armpit.**  
 24 **Q.** And, if I understand, an axillary  
 25 temperature is not going to be as accurate as a

1 rectal temperature; correct?  
 2 **A. Correct.**  
 3 **Q.** But it's usually a few degrees off from a  
 4 rectal temperature?  
 5 **A. Correct.**  
 6 **Q.** And the time noted here is at 6:25 p.m.;  
 7 correct?  
 8 **A. Yes.**  
 9 **Q.** And so the paramedic took an axillary  
 10 temperature of Ms. Neuman at 6:25, and it was 97.5  
 11 degrees Farenheit; is that correct?  
 12 **A. Yes.**  
 13 **Q.** On that same page, the EMS or the  
 14 paramedic also noted a rectal temperature -- and  
 15 I'm sorry. That's really small. But it reads 38.4  
 16 degrees Farenheit?  
 17 **A. That's Celsius.**  
 18 **Q.** I'm sorry. Celsius. And that was taken  
 19 at 7:00 p.m.; is that right?  
 20 **A. Yes.**  
 21 **Q.** Let's talk about the temperature. In  
 22 this particular case with Ms. Neuman, the highest  
 23 recorded temperature you had on her was the rectal  
 24 temperature that Mr. Hughes referred to at  
 25 6:46 p.m. in the ER; is that right?

1 **A. Yes.**  
 2 **Q.** And that was 38.7 degrees Celsius, which  
 3 is, I think, 101.66 degrees Farenheit; correct?  
 4 **A. I'm not sure of the exact number. It was**  
 5 **38.7 Celsius.**  
 6 **Q.** That's well below the threshold we talked  
 7 about earlier with regards to heat stroke; is that  
 8 correct?  
 9 **A. Yes.**  
 10 **Q.** You talked to Mr. Hughes a little bit  
 11 about cooling measures. And I think the word you  
 12 used -- I might have misheard -- was  
 13 "multifactorial." That there are a lot of  
 14 different variables that will go into whether or  
 15 not somebody who is found at 104, 105 might later  
 16 on be cooled down to 101; correct?  
 17 **A. Yes.**  
 18 **Q.** As you sit here today, you just don't  
 19 know what those factors are; correct?  
 20 **A. Yes.**  
 21 **Q.** You don't know how long she was out;  
 22 correct?  
 23 **A. Yes.**  
 24 **Q.** You don't know what the ambient  
 25 temperature was that day?

1 **A. Correct.**  
 2 **Q.** And you don't know how much cooling,  
 3 meaning water, was done or not?  
 4 **A. Yes.**  
 5 **Q.** So I just want to make sure that the  
 6 questions that Mr. Hughes asked you -- right now  
 7 you're just not sure whether or not Ms. Neuman was  
 8 ever at 104 at the time she was taken out of the  
 9 sweat lodge; correct?  
 10 **A. Correct. I don't know that.**  
 11 **Q.** So the only evidence you have in front of  
 12 you right now is the fact that a rectal temperature  
 13 was taken at 6:46 p.m. of 38.7 degrees Celsius?  
 14 **A. Correct.**  
 15 **Q.** I want to talk about dehydration.  
 16 Mr. Hughes asked you some questions about that, and  
 17 I heard you and he talk about dryness as being a  
 18 sign of dehydration. Is that correct?  
 19 **A. Correct.**  
 20 **Q.** There are actually clinical markers of  
 21 dehydration; correct?  
 22 **A. I guess -- which ones are you referring**  
 23 **to?**  
 24 **Q.** There are many clinical --  
 25 **A. Yes.**

1 **Q.** Okay. I want to talk about that for just  
 2 a second. When you have a patient that you suspect  
 3 of being dehydrated, you can send out lab work;  
 4 correct?  
 5 **A. Yes.**  
 6 **Q.** And one of the things that you're going  
 7 to look at is sodium -- right? -- which is NA on  
 8 the elements chart?  
 9 **A. Yes.**  
 10 **Q.** The other one is chloride; correct?  
 11 **A. Yes.**  
 12 **Q.** And another one you're going to look at  
 13 is BUN, which stands for?  
 14 **A. Blood urea nitrate.**  
 15 **Q.** The other marker for dehydration is  
 16 something called "UA, specific gravity"; correct?  
 17 **A. Yes.**  
 18 **Q.** And so rather than guessing because  
 19 somebody might be dry or not, you could actually  
 20 send out lab work to determine diagnostically  
 21 whether they're dehydrated; correct?  
 22 **A. Yes.**  
 23 **Q.** And in this case are you aware that lab  
 24 work for Ms. Neuman was sent out at 7:00 p.m.?  
 25 **A. Yes.**

1 Q. Let's talk about that for just a second.

2 If you could turn to Exhibit 365. And I'm going to  
3 ask you to look at your Bates stamp 2841.

4 A. **I'm not understanding this numbering  
5 system on these.**

6 Q. Let me help you. Doctor, we're referring  
7 to the number on the bottom right-hand corner. The  
8 page we're looking at now is the results or the  
9 results from that lab work that we're talking  
10 about; correct?

11 A. **Yes.**

12 Q. And, again, the records are so small, but  
13 let me see if I can zero in. The time that we're  
14 looking at is October 8, 2009, at 1700 hours;  
15 correct?

16 A. **Yes.**

17 Q. I'm sorry. 1900, which is 7:00 p.m.;  
18 correct?

19 A. **Correct.**

20 Q. And that number we see here, the 137,  
21 refers to her sodium level; correct?

22 A. **Correct.**

23 Q. And her sodium level was completely  
24 normal; correct?

25 A. **Correct.**

1 Q. And then I won't zero in on the rest of  
2 the document there. But on this page, Bates  
3 stamped 2841, her chloride was 102; correct?  
4 Totally normal?

5 A. **Correct.**

6 Q. Her BUN, her blood urea nitrogen, is 15;  
7 correct?

8 A. **I'm not seeing.**

9 Q. Let me see if I can help you here. The  
10 last column here is BUN, blood urea nitrogen;  
11 correct? Up here?

12 A. **Are you referring just to the bottom one?**

13 Q. Yes. So at 7:00 p.m. her blood urea  
14 nitrogen was 15; correct?

15 A. **Yes.**

16 Q. Completely normal?

17 A. **Yes.**

18 Q. And so looking at the sodium chloride,  
19 BUN, that's typically what's called a "dehydration  
20 profile"; correct?

21 A. **Yes.**

22 Q. And Ms. Neuman's profile based on  
23 chemistry showed she was not dehydrated; correct?

24 A. **Not necessarily.**

25 Q. I understand.

1 A. **It's not as straightforward to say there  
2 is a normal, because there is a equilibration of  
3 fluid shifts that happen. So someone can be  
4 dehydrated with totally normal numbers. That  
5 doesn't mean they weren't dehydrated.**

6 Q. Let me try to unpack it so we understand.  
7 These particular numbers show, at least  
8 diagnostically, that she doesn't have a dehydration  
9 profile?

10 A. **It's a normal profile.**

11 Q. It's a normal profile. So what you're  
12 saying is there are, and we talked about this, the  
13 multifactorial?

14 A. **Yeah.**

15 Q. There are things before that that you  
16 just don't know that could have affected her  
17 numbers here; correct?

18 A. **Yes. But I also say it's -- lots of  
19 times it's not -- I wouldn't call "dehydration" a  
20 laboratory diagnosis. I called it a clinical  
21 diagnosis.**

22 Q. Okay. I'm sorry. We'll use -- what does  
23 that mean?

24 A. **The fact that somebody has a low blood  
25 pressure and tachycardia would suggest volume under**

1 **load. I mean that they were dehydrated and  
2 hypovolemic. And it would trump these numbers to  
3 me.**

4 Q. Got it. And hypovolemic is?

5 A. **Just low volume associated with  
6 dehydration.**

7 Q. Low volume of --

8 A. **You're seeing -- it can potentially mean  
9 that. There are other -- you're mentioning  
10 organophosphates. That can raise heart rate as  
11 well. But you can -- you know -- that's suggesting  
12 a volume depletion picture. And you would expect a  
13 normal heart rate, a normal blood pressure, if you  
14 had normal blood volume and weren't dehydrated.**

15 Q. Okay. We'll talk about the blood  
16 pressure. But for now I want to make sure we're on  
17 the same page with regards to these particular  
18 markers. These are all markers that doctors and  
19 physicians will look at to see if there is clinical  
20 dehydration?

21 A. **I would say all those markers are normal.  
22 But it doesn't clearly indicate the normal fluid  
23 status.**

24 Q. Got it. At 7:00 p.m. what was  
25 Ms. Neuman's UA specific gravity? Normal or not?

1 **A. Where is that?**  
 2 **Q.** It's at your Bates stamp 2863.  
 3 **A. 1.004.**  
 4 **Q.** Within the normal range; correct?  
 5 **A. Correct.**  
 6 **Q.** And Mr. Hughes has already clarified or  
 7 cleared up under direct that you may have gotten  
 8 hearsay -- by "you" I mean the doctors or the  
 9 nurses had gotten hearsay information that  
 10 Ms. Neuman had been fasting. And that turned out  
 11 to be incorrect; correct?  
 12 **A. Yes.**  
 13 **Q.** Okay. Let's talk about her pinpoint  
 14 pupils. Looking at Exhibit 365, Doctor, and that  
 15 would be your Bates stamp 314. I'm sorry. Excuse  
 16 me. 2597. Let me know when you're there.  
 17 **A. Okay.**  
 18 **Q.** This page, 2597, is the run sheet from  
 19 Verde Valley Fire District; correct?  
 20 **A. Yes.**  
 21 **Q.** And so this would be whatever information  
 22 was taken by the paramedics or EMS services from  
 23 Verde Valley Fire District; correct?  
 24 **A. Yes.**  
 25 **Q.** And you will note on the left-hand corner

1 a time of 5155 -- I'm sorry. That's a colon.  
 2 5:55 p.m.; correct?  
 3 **A. Yes.**  
 4 **Q.** And what was noted about her pupils at  
 5 5:55 p.m.?  
 6 **A. Two millimeter pupils that were**  
 7 **nonreactive.**  
 8 **Q.** Okay. And those are the pinpoint pupils  
 9 we talked about; right?  
 10 **A. Yes.**  
 11 **Q.** Now, Mr. Hughes suggested earlier that  
 12 Narcan was given to Ms. Neuman that might have  
 13 affected the size of her pupils. Do you remember  
 14 that?  
 15 **A. Yes. It would potentially affect it.**  
 16 **Q.** Do you know what time Ms. Neuman received  
 17 Narcan?  
 18 **A. I do not.**  
 19 **Q.** So you don't know whether it was before  
 20 or after this particular paramedic at 5:45 p.m.  
 21 noted that they were two millimeters?  
 22 **A. He had the time, I think, on the one. I**  
 23 **don't remember what that was.**  
 24 **Q.** Okay. Why don't we take a look at  
 25 Exhibit 369. Do you have that in front of you,

1 sir?  
 2 **A. What number is that?**  
 3 **Q.** Exhibit 369.  
 4 **A. Is that one of these other two-five**  
 5 **numbers or not?**  
 6 **Q.** I'm sorry. I may have misspoken. Give  
 7 me one second.  
 8 Let me do this: I believe earlier when  
 9 Mr. Hughes was asking you and he was looking at the  
 10 record, you agreed with him that she received  
 11 Narcan at 1845. Do you recall that?  
 12 **A. Yes.**  
 13 **Q.** And that would be 6:45; correct?  
 14 **A. Yes.**  
 15 **Q.** That would be after the paramedic  
 16 responded and saw her eyes at the two millimeters;  
 17 correct?  
 18 **A. Yes.**  
 19 **Q.** So if she received the Narcan after he  
 20 observed her pupils to be pinpoint, the Narcan  
 21 isn't relevant for our purposes here; correct?  
 22 **A. Unless the Narcan corrected it then**  
 23 **would be the question. The Narcan is used just**  
 24 **empirically to see if there is an effect. So if**  
 25 **the pupils would have enlarged after that. But**

1 **there was no response, from what he said.**  
 2 **Q.** Okay. I think I understand you. But I  
 3 want to make sure we're clear on it. Her pinpoint  
 4 pupils were to be two millimeters at 5:55 p.m.;  
 5 correct?  
 6 **A. Yes.**  
 7 **Q.** The Narcan was given to her at what time?  
 8 **A. There was no effect from that dose of**  
 9 **Narcan.**  
 10 **Q.** There we go. And, to your knowledge, did  
 11 she get Narcan before the 6:45 p.m. dose?  
 12 **A. Not to my knowledge.**  
 13 **Q.** Okay. So if she did not receive Narcan  
 14 before 6:45, then the 2 millimeters that the  
 15 paramedics observed is a 2 millimeter; correct?  
 16 **A. Yes.**  
 17 **Q.** All right. Now, we had talked about how  
 18 the pinpoint pupils, not only Ms. Neuman but all  
 19 the other critically ill patients, were a red flag  
 20 to you and the doctors that you might be dealing  
 21 with a toxidrome; correct?  
 22 **A. Yes.**  
 23 **Q.** I want to now move into the specific  
 24 evaluation of Ms. Neuman once you received her.  
 25 She came into the ER; correct?

1 **A. Yes.**  
 2 **Q.** And according to normal protocol, she  
 3 would have been seen by an ER doctor?  
 4 **A. Yes.**  
 5 **Q.** And the ER doctor in this instance was  
 6 Dr. Mark Peterson?  
 7 **A. Yes.**  
 8 **Q.** After Dr. Mark Peterson evaluated her and  
 9 determined she was a critically ill patient, she  
 10 then was turned over to your care?  
 11 **A. Yes.**  
 12 **Q.** And transferred to the ICU?  
 13 **A. Correct.**  
 14 **Q.** And, again, you would have had access to  
 15 whatever information that Dr. Peterson had  
 16 observed; correct?  
 17 **A. It would have been all written. It's not**  
 18 **on the computer chart. So we'd have access to a**  
 19 **handful of papers that ended up on the table next**  
 20 **to the critically ill person. Sometimes there is**  
 21 **things that kind of end up in the chart later. We**  
 22 **do have access to whatever is available. I would**  
 23 **say that.**  
 24 **Q.** And was Dr. Mark Peterson one of the  
 25 doctors that you spoke of earlier where sort of the

1 doctors at Flagstaff medical were collaborating and  
 2 trying to figure out the puzzle?  
 3 **A. Yes.**  
 4 **Q.** So I'd ask you now to turn to Dr. Mark  
 5 Peterson's ER evaluation and -- in Exhibit 366.  
 6 **A. Okay.**  
 7 **Q.** And I'll refer you to Bates stamp 3026.  
 8 Are we on the same page, Doctor?  
 9 **A. Okay.**  
 10 **Q.** The ER evaluation is something that  
 11 Dr. Peterson would have drafted; and it would  
 12 contain all of the information that he saw or  
 13 observed when Ms. Neuman presented the ER at  
 14 6:46 p.m.; correct?  
 15 **A. Yes.**  
 16 **Q.** So looking at the page, your Bates stamp  
 17 3026, Dr. Peterson is referring to an exam that he  
 18 conducted on October 8, 2009; correct?  
 19 **A. Yes.**  
 20 **Q.** And the time on that is 6:46 is the  
 21 triage time; is that correct?  
 22 **A. Yes.**  
 23 **Q.** And under the history or the history of  
 24 the present illness, Dr. Peterson -- and you would  
 25 agree with me that Dr. Peterson would have been the

1 first eyes on Ms. Neuman at Flagstaff by a doctor;  
 2 correct?  
 3 **A. The first physician. Yes.**  
 4 **Q.** I want to focus in on this. I'm not sure  
 5 Mr. Hughes showed you this. Dr. Peterson, who put  
 6 his eyes on Ms. Neuman and seeing all the signs and  
 7 symptoms that he observed wrote, it is suspected  
 8 that she has had some sort of toxidrome/ingestion  
 9 but otherwise this is not known; is that correct?  
 10 **A. Yes.**  
 11 **Q.** Now, you all had understood, based upon  
 12 the hearsay information, that these patients came  
 13 from a heated environment; correct?  
 14 **A. Yes.**  
 15 **Q.** A sweat lodge ceremony?  
 16 **A. Yes.**  
 17 **Q.** But you didn't presume just from that  
 18 mere fact that you were dealing with heat stroke;  
 19 correct?  
 20 **A. We were considering heat stroke the same**  
 21 **way we were considering a toxidrome syndrome.**  
 22 **Q.** What I'm asking, as a doctor, as a  
 23 medical physician, you're not going to presume from  
 24 one circumstantial fact that this is what caused  
 25 it? You're going to look at more information?

1 **A. Correct.**  
 2 **Q.** And based on the signs and symptoms,  
 3 including the pinpoint pupils, Dr. Peterson  
 4 suspected she had some sort of toxidrome or  
 5 ingestion; correct?  
 6 **A. Yes.**  
 7 **Q.** We talked about blood pressure. Blood  
 8 pressure that you would expect to see in the case  
 9 of heat stroke would be normal to low; correct?  
 10 **A. Yes.**  
 11 **Q.** And would be normal to high in a  
 12 toxidrome; correct?  
 13 **A. Yes.**  
 14 **Q.** Looking at the second page of  
 15 Dr. Peterson's report, what did Dr. Peterson note  
 16 was her blood pressure upon presentation to the ER?  
 17 **A. 204 over 79.**  
 18 **Q.** Is that high or low, Doctor?  
 19 **A. It's high.**  
 20 **Q.** Is it mildly high or very high?  
 21 **A. It's very high. Those are also numbers**  
 22 **that we commonly see in people that are intubated**  
 23 **that are coming off a paralytic.**  
 24 **Q.** Do you know if she was --  
 25 **A. The problem with all these questions is**

1 **there is just a lot of variables going on with all**  
2 **these things. It's a high number.**

3 **Q.** Okay. Do you know whether or not she was  
4 on paralytics? Let me make sure we -- can you tell  
5 the jury what the paralytics are.

6 **A.** **She was intubated. I'm not sure what the**  
7 **induction drugs were for the intubation. They're**  
8 **probably on that record. To be paralyzed to put**  
9 **the breathing tube in the throat, it's common to**  
10 **have a gag reflex. And it's a bite. And we can't**  
11 **get a good look to get a tube in the airway without**  
12 **giving muscle relaxer medications.**

13 **So we effectively paralyze people to get**  
14 **that tube in. But if they're not sedated, they**  
15 **begin to wake up paralyzed with a tube in their**  
16 **throat, they can get very agitated quickly too.**

17 **It's not uncommon to see someone that's**  
18 **getting transferred up from the field that got**  
19 **intubate to have the drugs start to wear off in the**  
20 **emergency room and have the really high blood**  
21 **pressure.**

22 **There is just a lot of things that are**  
23 **happening because there is a lot of very dynamic**  
24 **things that have happened to their bodies and this**  
25 **whole process of getting picked up, flown across in**

1 **an ambulance and then the drugs.**

2 **So we see a lot of fluctuations. It's**  
3 **hard to pin down exactly what's what during that**  
4 **period of time. It is a high blood pressure.**

5 **Q.** Thank you for that clarification. So if  
6 she received paralytics -- and that's one cause for  
7 the very high blood pressure that we've seen?

8 **A.** **Yes.**

9 **Q.** If she didn't receive paralytics, that  
10 would be inconsistent with the normal to low that  
11 you might see in heat stroke; correct?

12 **A.** **Yes.**

13 **Q.** It is consistent, if she didn't get  
14 paralytics, of seeing normal to high blood pressure  
15 in the case of a cholinergic toxidrome?

16 **A.** **Yes.**

17 **Q.** Dr. Peterson then went on to note a  
18 number of other signs and symptoms that he saw in  
19 Ms. Neuman. And I'd like to talk about that. If  
20 you were on Bates stamp 3027, Doctor, I'd like to  
21 focus in on the physical exam.

22 **"Obtunded" means that she was**  
23 **unresponsive; correct?**

24 **A.** **Yes.**

25 **Q.** Here again we see the pupils are

1 pinpoint; correct?

2 **A.** **Yes.**

3 **Q.** We see the temperature of 38.7 rectally;  
4 correct?

5 **A.** **Yes.**

6 **Q.** Which is about 101 Farenheit?

7 **A.** **Yes.**

8 **Q.** We also see she's incontinent of stool;  
9 is that correct?

10 **A.** **Yes.**

11 **Q.** Incontinent of stool is something that  
12 you would see in the case of a cholinergic  
13 toxidrome; correct?

14 **A.** **Yes.**

15 **Q.** Is it something that you would see in the  
16 case of heat stroke?

17 **A.** **Something that's not uncommon to see in**  
18 **someone obtunded and intubated.**

19 **Q.** Okay. I'm not sure if I got the answer.  
20 Is it something that you would see in the case of  
21 heat stroke?

22 **A.** **No.**

23 **Q.** Okay. But you might see it in the case  
24 of a person who for whatever cause is obtunded and  
25 intubated?

1 **A.** **Yes.**

2 **Q.** If it isn't obtunded or intubated, it's a  
3 factor that's consistent with a cholinergic  
4 toxidrome; correct?

5 **A.** **Yes.**

6 **Q.** And, again, here we noted blood initially  
7 is 204 over 79, which you indicated is very high;  
8 correct?

9 **A.** **Yes.**

10 **Q.** You talked about how you would expect to  
11 see in an anticholinergic toxidrome dry mucosa?

12 **A.** **Yes.**

13 **Q.** And here Dr. Peterson in the ER noted  
14 pink mucosa but made no mention of it being dry;  
15 correct?

16 **A.** **Yes.**

17 **Q.** So after observing Ms. Neuman with all of  
18 these various signs and symptoms, he came up with a  
19 number of diagnoses, working diagnoses; is that  
20 correct?

21 **A.** **Yes.**

22 **Q.** And I'd ask you to turn to your Bates  
23 stamp 3028, Doctor.

24 **A.** **Yes.**

25 **Q.** And at the bottom of that Dr. Peterson



1 indicated what his working diagnoses were; correct?  
 2 A. Yes.  
 3 Q. One is acute altered mental status;  
 4 correct?  
 5 A. Yes.  
 6 Q. Acute renal insufficiency; correct?  
 7 A. Yes.  
 8 Q. Metabolic acidosis?  
 9 A. Yes.  
 10 Q. As we already talked, those three things  
 11 are nonspecific to heat stroke and can be  
 12 consistent with a toxidrome or with heat stress;  
 13 correct?  
 14 A. Yes.  
 15 Q. And Dr. Peterson, upon seeing the signs  
 16 and symptoms, said, consider heat stroke,  
 17 heart-related injury; correct?  
 18 A. Yes.  
 19 Q. And also consider toxidrome of  
 20 anticholinergic ingestion; correct?  
 21 A. Yes.  
 22 Q. And this goes back to what we talked  
 23 about earlier, the differential diagnosis; correct?  
 24 A. Yes.  
 25 Q. Where you see a pattern of signs and

1 symptoms that could suggest one cause or another  
 2 where they mirror each other. That's what this is;  
 3 correct?  
 4 A. Yes.  
 5 Q. Now, because we already know that Liz  
 6 Neuman had pinpoint pupils -- and perhaps this was  
 7 a dictation issue -- it would be more accurate to  
 8 say toxidrome of a cholinergic ingestion; correct?  
 9 On the pupils. I understand there are other  
 10 factors.  
 11 A. Yeah. On the pupils.  
 12 Q. Because in an anticholinergic you have  
 13 dilated ones; correct?  
 14 A. Yes.  
 15 Q. Okay. Now, after Dr. Peterson saw her in  
 16 the ER, she then turned to your care in the ICU?  
 17 A. Yes.  
 18 Q. Is that correct? Let me have you turn to  
 19 your records, then, Doctor. And it's Exhibit 366.  
 20 You wrote up what's called a "critical care  
 21 evaluation"?  
 22 A. Yes.  
 23 Q. And I'll ask you to turn to that  
 24 evaluation. And it's going to be at your Bates  
 25 stamp 003014.

1 A. Okay.  
 2 Q. And the time of your evaluation is noted  
 3 at the top; correct?  
 4 A. Yes.  
 5 Q. And that would be at 2225, which is  
 6 10:25?  
 7 A. Correct.  
 8 Q. And at 10:25 you still noted she had  
 9 pinpoint pupils; correct?  
 10 A. Yes.  
 11 Q. You noted that she appeared to be dry  
 12 with red eyes; correct?  
 13 A. Yes.  
 14 Q. Now, when you say, "dry with red eyes,"  
 15 what does the "dry" refer to?  
 16 A. Just all the appearance of the vitreous  
 17 of the eyes.  
 18 Q. It's specific to the eyes; is that right?  
 19 A. Yes.  
 20 Q. You're not referring to the skin?  
 21 A. Correct.  
 22 Q. You also noted that she was tachycardic;  
 23 correct?  
 24 A. Yes.  
 25 Q. And based upon that presentation, you

1 also noted in your evaluation consistent with a  
 2 possible anticholinergic syndrome; correct?  
 3 A. Yes.  
 4 Q. And, again, at this time you were aware  
 5 that she came from a heated environment; correct?  
 6 A. Yes.  
 7 Q. And nobody when she presented to the ER  
 8 put her in an ice bath; correct?  
 9 A. Correct.  
 10 Q. The cooling measures we talked about, the  
 11 ice pack to the groin -- none of that happened;  
 12 correct?  
 13 A. Actually, I don't recall for sure.  
 14 Q. Okay. Fair enough. You did give  
 15 something called a "charcoal lavage"; is that  
 16 correct?  
 17 A. Yes.  
 18 Q. And that's --  
 19 A. That was done in the emergency room. Not  
 20 by me. That was given before I'd seen her.  
 21 Q. Okay. Thank you for that clarification.  
 22 And charcoal lavage. Can you tell the jury what  
 23 that is and what it's used for.  
 24 A. Specifically if there's a medical --  
 25 medication ingestion, it will bind up a lot of

1 **drugs and try to prevent further absorption. So if**  
 2 **this would have been a big antihistamine ingestion**  
 3 **or something like that, it can bind things up in**  
 4 **the stomach, prevent it from getting worse. So**  
 5 **it's an actual -- it's a charcoal component that's**  
 6 **given directly into stomach through a tube.**

7 Q. So if I understand correctly, first of  
 8 all, this was done in the ER; is that right?

9 A. Yes.

10 Q. And it's an emergency decontaminant?

11 A. Yes.

12 Q. And, basically, what it does is it goes  
 13 into your GI system, your stomach, or your  
 14 intestinals, and it reduces the absorption rate of  
 15 whatever is going on; correct?

16 A. Yes.

17 Q. And in this case she was given a charcoal  
 18 lavage because you and Dr. Peterson or Dr. Peterson  
 19 had suspected a toxidrome; correct?

20 A. Yes.

21 Q. And that is an acute ingestion or  
 22 exposure to a toxin; correct?

23 A. Yes.

24 Q. And so when she presented at 6:46 in the  
 25 ER and the doctor puts his eyes on her, the first

1 thing he does with her is give her a charcoal  
 2 lavage, which is a treatment of a poison; correct?

3 A. Yes. Correct.

4 Q. After you noted all of these various  
 5 signs and symptoms, and, again, even on your  
 6 observation she had pinpoint pupils; is that right?

7 A. Yes.

8 Q. She still had a rectal temperature of  
 9 38.7 degrees Celsius?

10 A. Correct.

11 Q. Which is still 101 Fahrenheit; correct?

12 A. Yes.

13 Q. And you knew from the lab workup at  
 14 7:00 p.m. that she showed normal markers for  
 15 dehydration; correct?

16 A. Normal electrolytes. Yes.

17 Q. Normal electrolytes. Thank you. And  
 18 then you indicated at the end of your evaluation --  
 19 if I could direct your attention to Bates stamp  
 20 3016. At the top, as you told Mr. Hughes, ABG,  
 21 arterial blood gas -- you did that and it showed no  
 22 sign of carbon monoxide poisoning; correct?

23 A. Correct.

24 Q. And so that was ruled out?

25 A. Yes.

1 Q. You indicated in paragraph 2 -- you  
 2 talked about a creatinine of 1.7?

3 A. Yes.

4 Q. And we talked about that earlier. That's  
 5 a marker of the renal function; right?

6 A. Yes.

7 Q. Kidney function. And you then wrote here  
 8 based upon that elevated creatinine -- first of  
 9 all, is that a significantly elevated creatinine or  
 10 mildly elevated?

11 A. Normal level is 1. It's significant in  
 12 someone who's presenting acutely ill because it's  
 13 potentially rapidly increasing. So it's an initial  
 14 value that may get considerably worse by the time  
 15 you do a repeat.

16 Q. Okay.

17 A. So it's above normal, and it's something  
 18 of concern in someone coming in ill like this.

19 Q. And she did show signs of acute renal  
 20 failure; correct?

21 A. That test specifically at the beginning  
 22 was one. Yes.

23 Q. Okay. You indicated in your discussion  
 24 of acute renal failure that it is likely, it is  
 25 likely, that she was dehydrated at the time of

1 presentation, and it is unknown how long she was  
 2 down prior to being transported; correct?

3 A. Yes.

4 Q. So is it fair to say that your best guess  
 5 at that time was that she was dehydrated?

6 A. Yes. And she was having persistent  
 7 tachycardia to suggest she was volume depleted at  
 8 that time as well.

9 Q. Okay. That would not be necessarily  
 10 consistent with the chemistry that we just talked  
 11 about, those markers; correct?

12 A. It would be more concerning to me that  
 13 she was tachycardic regardless of what the sodium  
 14 was.

15 Q. Okay. But, again, because I'm just  
 16 looking at your language, Doctor, when you say it  
 17 is likely, that's your best guess; correct?

18 A. Yes.

19 Q. Now, going back to your assessment and  
 20 plan, I'd like you to focus in on this paragraph,  
 21 paragraph 3.

22 A. Okay.

23 Q. She's now been seen by Dr. Peterson in  
 24 the ER who suspected a toxidrome and gave her a  
 25 charcoal lavage to pump her stomach of any poison;

1 correct?

2 **A. Yes.**

3 **Q.** Now, in the ICU you put your eyes on her.

4 And you wrote under your assessment and plan "acute  
5 ingestion"; correct?

6 **A. Yes.**

7 **Q.** So you agreed with Dr. Peterson that  
8 based upon the signs and symptoms that she  
9 presented, there was a puzzle going on; correct?

10 **A. Yes.**

11 **Q.** Something didn't make sense. Fair to  
12 say?

13 **A. Yes.**

14 **Q.** And that something that didn't make  
15 sense, that something that nagged at you, was a  
16 possibility of an acute ingestion; correct?

17 **A. Possibility. Yes.**

18 **Q.** And you even wrote -- let me highlight  
19 that. This is an odd presentation, and the facts  
20 of the presentation remain unclear at this point;  
21 correct?

22 **A. Yes.**

23 **Q.** And, again, not questioning your care,  
24 you were working on what you could see and the  
25 limited information you received about the scene;

1 correct?

2 **A. Yes.**

3 **Q.** And here you wrote, acute ingestion.

4 This is an odd presentation, and the facts of the  
5 presentation remain unclear at this point.

6 The only known substances involved in the  
7 sweat house were sandalwood chips and frankincense  
8 resin; correct?

9 **A. Yes.**

10 **Q.** Neither of which you noted has a known  
11 toxicity; correct?

12 **A. Yes. I'll say that that should be --**  
13 **that's inconsistent with the pinpoint pupils.**  
14 **That's an error on my part there.**

15 **Q.** Okay. You're reading into the next  
16 paragraph?

17 **A. Yes.**

18 **Q.** Okay. Let me focus the jury on that.  
19 What you said here was presentation appeared to be  
20 consistent with an anticholinergic state with  
21 pinpoint pupils; correct?

22 **A. Yes.**

23 **Q.** So the clarification is that because she  
24 had pinpoint pupils, it would be cholinergic?

25 **A. Yeah. I think the rest of that is --**

1 **well, it should be anticholinergic. But that**

2 **one -- the pinpoint is an inconsistency with the**  
3 **anticholinergic.**

4 **Q.** All right.

5 **A. The rest of that statement would be true.**

6 **Q.** Would your assessment of Ms. Neuman,  
7 given she had pinpoint pupils, you're thinking of a  
8 toxidrome, would it have been consistent with your  
9 evaluation had you known that Ms. Neuman was  
10 foaming at the scene -- hypersecretion?

11 **A. I guess we were seeing the opposite here.**  
12 **Potentially it's the opposite presentation of what**  
13 **we were seeing at that point several hours later.**

14 **Q.** Correct. I understand. So when you saw  
15 her at 10:25, she was no longer foaming; correct?

16 **A. Correct.**

17 **Q.** But if people saw her when she was  
18 immediately extracted from the sweat lodge foaming  
19 along with five other people, that would have been  
20 consistent with the killer bees that we talked  
21 about?

22 **A. Foaming is more consistent with**  
23 **cholinergic. Yes.**

24 **Q.** All right. What I'm gathering from your  
25 evaluation and Dr. Peterson's evaluation is that

1 this picture wasn't very clear. Was it?

2 **A. Not initially.**

3 **Q.** We'll talk about the summary you wrote  
4 when Ms. Neuman was taken off of life support on  
5 the 17th. But for those nine days when you were  
6 working with the other doctors to try and figure it  
7 out, it's fair to say it was, as you called it, an  
8 "odd presentation"; correct?

9 **A. Yes.**

10 **Q.** Meaning that it just didn't quite make  
11 sense to you? It wasn't quite clear that was heat  
12 stroke; correct?

13 **A. Correct.**

14 **Q.** There were presentations that made you  
15 and the other doctors, not just Dr. Peterson, but  
16 the doctors treating Stephen Ray and Tess Wong and  
17 Sidney Spencer -- everyone was thinking toxidrome;  
18 correct?

19 **A. Yes.**

20 **Q.** On October 17 Ms. Neuman was taken off of  
21 life support; correct?

22 **A. Yes.**

23 **Q.** And you wrote then a summary. And I'll  
24 ask you to refer, then, to Exhibit 366, Bates stamp  
25 3018.

- 1 **A. Okay.**  
 2 **Q.** I'm sorry. I'm going to make you go back  
 3 to Bates stamp 3016. Under your assessment and  
 4 plan -- I'm sorry to do this. I'm going to have  
 5 you go back to 3014.  
 6 **A. Okay.**  
 7 **Q.** When you evaluated Ms. Neuman in critical  
 8 care, you noted admission diagnosis; correct?  
 9 **A. Yes.**  
 10 **Q.** Would that admission diagnosis be yours  
 11 or is that another doctor's?  
 12 **A. That was mine.**  
 13 **Q.** It's not working. Under admission  
 14 diagnosis could you tell the jury what your  
 15 diagnosis of Ms. Neuman was on October 8.  
 16 **A. Respiratory failure, acute renal failure**  
 17 **and attended mental status.**  
 18 **Q.** Okay. Now I want you to go, if you will,  
 19 Doctor, to your summary at page 3018.  
 20 **A. Okay.**  
 21 **Q.** Your admitting diagnosis, I noticed,  
 22 changed from October 8 to the time you wrote this  
 23 report of October 17. Is that fair to say?  
 24 **A. Yes.**  
 25 **Q.** An admitting diagnosis is your impression

- 1 upon admission; correct?  
 2 **A. Yes.**  
 3 **Q.** Upon your evaluation; correct?  
 4 **A. Yes.**  
 5 **Q.** It's not your final diagnosis; correct?  
 6 **A. Correct.**  
 7 **Q.** And so in the first instance when you saw  
 8 her, you made no mention of heat stroke; is that  
 9 correct?  
 10 **A. Correct.**  
 11 **Q.** And then in this admitting diagnosis on  
 12 October 17, you wrote, heat stroke with anoxic  
 13 brain injury; is that correct?  
 14 **A. Yes.**  
 15 **Q.** Can you tell me why that changed -- and I  
 16 understand when you talk about your final  
 17 diagnosis, but under admitting diagnosis why that  
 18 changed.  
 19 **A. Part of that is some of it is to do with**  
 20 **medical billing. And it's not a cause of death to**  
 21 **say respiratory failure for medical billing. And**  
 22 **so there needs to be some clarification, when**  
 23 **you're approaching a death summary, of what**  
 24 **billable causes of death and what can be written on**  
 25 **a death certificate. And they won't accept vaguer**

- 1 **answers than that. They need specifics of what the**  
 2 **cause was at the time.**  
 3 **So it does need to be clarified more**  
 4 **so -- you know -- at the time of death summary.**  
 5 **Q.** Okay. So you did that for the billing  
 6 purposes; correct?  
 7 **A. Yes. They need to be accurate as well.**  
 8 **But the reality is I don't always get to pick the**  
 9 **words I want to say for how it's done. Because**  
 10 **then if you put a nonbillable code, then they --**  
 11 **it's not something that you can -- it's not**  
 12 **acknowledged on the billing.**  
 13 **Q.** Okay. So if it were not for these  
 14 billing restrictions, you would have stayed with  
 15 the language you used on October 8; correct?  
 16 **A. We give them more information later on.**  
 17 **There definitely was the DIC picture and other**  
 18 **things that are developed. She went on to dialysis**  
 19 **and renal failure. So there was a lot more that**  
 20 **was known eight days into it. The anoxic brain**  
 21 **injury wasn't known at the time of her**  
 22 **presentation. It was more of a mental status**  
 23 **change. So there definitely was more information**  
 24 **acquired over the course of eight days as well.**  
 25 **Q.** Except for the information that we talked

- 1 about coming from the scene that you did not  
 2 receive; correct?  
 3 **A. Right. Correct. I would say the medical**  
 4 **information, just the clinical course and stuff.**  
 5 **We knew how that all went.**  
 6 **Q.** When you were talking to Mr. Hughes about  
 7 your diagnoses -- and, again, you clarified this  
 8 earlier. Your diagnosis of cause of death is  
 9 related to treatment. It's not what comes from,  
 10 for example, a forensic pathologist who decides for  
 11 legal reasons?  
 12 **A. We did all the stuff before that was even**  
 13 **done.**  
 14 **Q.** Okay. And so when you were talking to  
 15 Mr. Hughes about your medical determination of what  
 16 possibly could have been the cause, I heard you use  
 17 words like "possible", "could have been,"  
 18 "probably." There didn't seem to be a medical  
 19 certainty in that. Am I correct?  
 20 **A. I think it depends on what level, what**  
 21 **comfort level, you accept as a physician. There is**  
 22 **not a blood test that came back that said heat**  
 23 **stroke. So you, basically, have to put the**  
 24 **clinical scenario as well as you can together and**  
 25 **come up with a unifying diagnosis.**

- 1 Q. Okay.
- 2 A. **That's what the heat stroke came from.**
- 3 Q. Okay.
- 4 A. **There is always -- as we have talked**
- 5 **about, with all these factors, there is a lot of**
- 6 **different things and a lot of different symptoms**
- 7 **that overlap and interrelate. And none of these**
- 8 **have a blood test that just says what it was. So**
- 9 **we're always stuck with that at the time of death**
- 10 **to give our best interpretation of what the cause**
- 11 **of death was that unifies all the diagnoses.**
- 12 Q. Okay. And, again, so, there isn't
- 13 obviously certainty because, like you said, you
- 14 can't send it out for a blood test and it will come
- 15 back heat stroke; correct?
- 16 A. **Right.**
- 17 Q. But if you had been directed to possible
- 18 OP exposure, you could have sent out -- not that it
- 19 would have affected the care. You could have sent
- 20 that out to determine whether or not there were OPs
- 21 in her blood; correct?
- 22 A. **If there were different blood work with**
- 23 **that, it could have made things more definitive in**
- 24 **that respect.**
- 25 Q. Not being able to do that, your

- 1 determination on the date that she expired was heat
- 2 stroke, and that was the best interpretation given
- 3 the information you had; correct?
- 4 A. **Yes.**
- 5 Q. You still on -- this is now looking at
- 6 your summary of Ms. Neuman's expiration. You
- 7 wrote, acute renal failure, anoxic brain injury,
- 8 and disseminated intravascular coagulation
- 9 secondary to heat stroke; correct?
- 10 A. **Yes.**
- 11 Q. And, again, that's your best conclusion
- 12 given the information you had?
- 13 A. **Yes.**
- 14 Q. But you would agree with me that a lot of
- 15 signs and symptoms, not all of them, but a lot of
- 16 them that we've gone through could present for a
- 17 toxidrome, a cholinergic toxidrome; correct?
- 18 A. **Yes.**
- 19 Q. And that's what was puzzling you and the
- 20 other doctors; correct?
- 21 A. **Yeah. It was a complex case coming in.**
- 22 **That was part of the reason.**
- 23 Q. Now, I want to focus you in on the last
- 24 paragraph you wrote here. Your conclusion of what
- 25 possibly caused Ms. Neuman's death -- you still on

- 1 that date of October 17 were talking about a
- 2 chemical ingestion -- correct? -- that no other
- 3 chemical ingestion were known to you; correct?
- 4 A. **Yes.**
- 5 Q. And that, again, is because you had done
- 6 a toxicology screen. So the jury understands, that
- 7 screen is just for illicit drugs; correct?
- 8 A. **Correct.**
- 9 Q. Like methamphetamine, cocaine,
- 10 barbiturates; correct?
- 11 A. **Yes.**
- 12 Q. So you knew you could rule out a drug
- 13 overdose?
- 14 A. **Yes.**
- 15 Q. Is that correct? You knew you could rule
- 16 out carbon monoxide; correct?
- 17 A. **Yes.**
- 18 Q. Because of the -- how do you say that?
- 19 A. **Carboxyhemoglobin.**
- 20 Q. Thank you. But it still puzzles you even
- 21 on the day that she expired because you're talking
- 22 about no other chemical ingestion known; correct?
- 23 A. **Yes.**
- 24 MS. DO: Your Honor, is this the time for
- 25 break?

- 1 THE COURT: Yes. Thank you, Ms. Do.
- 2 Ladies and gentlemen, we will take the
- 3 afternoon recess at this time. So please remember
- 4 the admonition. And we will resume. Please be
- 5 back ready to come in at 10 after, in 20 minutes.
- 6 Thank you very much. We're in recess.
- 7 (Recess.)
- 8 THE COURT: The record will show the presence
- 9 of the defendant, Mr. Ray, the attorneys, the jury.
- 10 The witness, Dr. Cutshall, has returned to the
- 11 witness stand.
- 12 Ms. Do.
- 13 MS. DO: Thank you.
- 14 Q. Dr. Cutshall, I wanted to say thank you
- 15 again. You've been very patient, gone over a lot
- 16 of information. I want to now transition into
- 17 talking about the other patients that you
- 18 treated -- Tess Wong, Sidney Spencer. Okay?
- 19 A. **Okay.**
- 20 Q. Sidney Spencer also came into the ER that
- 21 night, and she was seen by Dr. Michael Earl?
- 22 A. **Yes.**
- 23 Q. Then she was deemed as a critically ill
- 24 patient, and you took over care for her in the ICU,
- 25 same as you did with Liz Neuman; is that right?

1 **A. Yes.**

2 **Q.** She was admitted under an alias. I think  
3 all four of these patients were. And hers was  
4 Romeo Romeo?

5 **A. Yes.**

6 **Q.** That was because she presented in a  
7 comatose state; correct?

8 **A. Just when if -- when it's a trauma, they**  
9 **assign a name like that initially until we verify**  
10 **the identification.**

11 **Q.** Because she wasn't --

12 **A. She wasn't responsive and couldn't**  
13 **provide us with details of who she was.**

14 **Q.** As we go through and talk about Sidney  
15 Spencer, we're going to be referring to her medical  
16 records, which are Exhibit 222.

17 Now, Ms. Spencer came in in a comatose  
18 state; is that correct?

19 **A. Yes. She was on a ventilator as well.**

20 **Q.** Okay. So she had been intubated in the  
21 field?

22 **A. Yes.**

23 **Q.** And that was because she showed early  
24 signs of respiratory failure?

25 **A. What's listed on the emergency room note**

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1 **was that her level of responsiveness, I think, was**  
2 **the primary reason.**

3 **Q.** Okay. Why don't we take a look at the  
4 records, then, at your Bates stamp 2084. We're  
5 going to be referring to the emergency room report  
6 by Dr. Michael Earl.

7 **A. Okay.**

8 **Q.** I'm going to direct your attention to the  
9 first page showing a triage time of 1955, which  
10 would be 7:55 p.m.; correct?

11 **A. Yes.**

12 **Q.** And time seen by me would be "me," as in  
13 Dr. Earl, 7:55; correct?

14 **A. Yes.**

15 **Q.** And Dr. Earl, when he saw her, she showed  
16 a Glasgow Coma Scale of 10 -- actually, let me take  
17 that back. The information he received from the  
18 field was that she had a GCS of 10 going down to a  
19 6; correct?

20 **A. Yes.**

21 **Q.** And that's very low on the GCS scale;  
22 correct?

23 **A. Yes. 6 is getting low.**

24 **Q.** And now looking at the second page of  
25 Dr. Earl's report, he indicated that she was in a

1 deep coma; correct? Let me direct your attention  
2 where it says medical decision making, the  
3 paragraph in the middle.

4 **A. Yeah. Says she's comatose, in a deep**  
5 **coma. Yes.**

6 **Q.** Similar to Liz Neuman; correct?

7 **A. Yes.**

8 **Q.** And for that reason, it's your belief she  
9 was intubated in the field; is that correct?

10 **A. I don't know their details of what they**  
11 **were thinking exactly. But that level of a Glasgow**  
12 **coma score would be threatening to the airway.**  
13 **That would be reason alone to do it.**

14 **Q.** Okay. And when she came into the ER, she  
15 was immediately put on a ventilator; correct?

16 **A. Yes. She's probably getting bagged with**  
17 **the mask on before she got in.**

18 **Q.** Can you tell the jury what that means.

19 **A. Well, when they put the tube in, ideally**  
20 **you're going to hook it up to a ventilator machine.**

21 **They don't always have the machine on the**  
22 **transport. So sometimes they do have some portable**  
23 **vents.**

24 **I imagine she was bagged with just an**  
25 **oxygen mask for a while through the tube, and then**

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1 **they connect her to a ventilator as soon as they**  
2 **have one available. Just kind of the logistics of**  
3 **the transport. She would be put on a portable**  
4 **ventilator as soon as she arrived in the emergency**  
5 **room.**

6 **Q.** And this is obviously a very critical  
7 condition that she presented in?

8 **A. Yes.**

9 **Q.** That she was intubated in the field,  
10 completely unresponsive, that she was admitted to  
11 the ER in a comatose state?

12 **A. Yes.**

13 **Q.** That would require her to be immediately  
14 put on a ventilator; is that correct?

15 **A. Yes.**

16 **Q.** Dr. Earl then evaluated her at 7:55. And  
17 I'd like to go through his evaluation with you.  
18 Again, like Liz Neuman, you would have had the  
19 benefit of Dr. Earl's observation his charts;  
20 correct?

21 **A. Yeah. Eventually.**

22 **Q.** Was Dr. Earl also one of the doctors who  
23 collaborated with you and the others to try and  
24 figure out this puzzle?

25 **A. Yes. I don't remember who I -- I don't**

1 know if I spoke with all of them at once, but  
2 they'd been speaking amongst each other when all  
3 these patients came in.

4 Q. Okay.

5 A. I know I did talk with several of the ED  
6 doctors.

7 Q. Let's take a look at Dr. Earl's  
8 evaluation of Ms. Spencer's pupils. He noted that  
9 they were also two millimeter pinpoint like Liz  
10 Neuman's; correct?

11 A. Yes.

12 Q. And that would be -- you do see that it's  
13 pupils noted to be approximately two millimeter and  
14 minimally reactive; correct?

15 A. Yes.

16 Q. He also noted that she had saliva around  
17 the tube. And the tube being?

18 A. Yes.

19 Q. And that was noted because that would be  
20 excessive saliva around the tube, which required it  
21 to be suctioned; is that correct?

22 A. I'm not sure why he noted it. Further on  
23 in the same thing he says she's had no excessive  
24 salivation at the bottom.

25 Q. Okay. And we'll get there.

1 A. I'm not sure what Dr. Earl was thinking  
2 when he did it.

3 Q. Fair enough. He noted she had saliva  
4 around the tube and was suctioned on arrival;  
5 correct?

6 A. That's documented.

7 Q. And then further down after he's done a  
8 complete evaluation, he talks about no excessive  
9 salivation?

10 A. Correct.

11 Q. Okay. He also noted in his evaluation of  
12 her the differential diagnoses that he came to  
13 based upon her signs and symptoms; correct?

14 A. Yes.

15 Q. And, again, that's because a lot of the  
16 signs and symptoms that Ms. Spencer showed could  
17 have been caused by a number of disorders; correct?

18 A. Yes.

19 Q. One of them, the first one, he indicated  
20 was toxicity secondary to carbon monoxide; correct?

21 A. Yes.

22 Q. So can you explain to the jury, what does  
23 it mean when a doctor says something is secondary  
24 to something else?

25 A. He was implying that there was -- the

1 mental status change in her presentation was as a  
2 result of carbon monoxide poisoning. This is  
3 before any of the levels were back.

4 Q. Okay.

5 A. So timing of the documentation varies  
6 on -- some people had all the results back, some  
7 didn't, by the time they completed documentation.

8 Q. Okay. So when he says, toxicity  
9 secondary to carbon monoxide at this time, it later  
10 was ruled out. We know it's not carbon monoxide;  
11 right?

12 A. He said he was waiting on the level. It  
13 wasn't back yet. But it was negative.

14 Q. Okay. At some point you were aware it  
15 came back negative?

16 A. Right.

17 Q. Okay. The secondary differential  
18 diagnose -- and if I may ask you, when a doctor  
19 writes a differential diagnoses and numbers them,  
20 is the order important at all?

21 A. I'd say not necessarily.

22 Q. Okay. So this is not like --

23 A. A lot of this is just to kind of pass  
24 along a train of thought what they were  
25 investigating, what they were looking into. And

1 obviously none of these things were a definitive  
2 diagnosis at this point.

3 Q. Got it. And that's information to pass  
4 on to you; correct?

5 A. Yes.

6 Q. Okay. The second thing he indicated  
7 based upon her signs and symptoms, again, he's  
8 still thinking of an ingestion, and it was a  
9 possible opiate overdose; correct?

10 A. Yes.

11 Q. Again, all of this is because she  
12 presented with the pinpoint pupils?

13 A. Yeah. That fits with the pinpoint  
14 pupils.

15 Q. All right. The third differential  
16 diagnosis is metabolic disturbances, including  
17 significant electrolyte or glucose abnormality;  
18 correct?

19 A. Yes.

20 Q. Like Liz Neuman, she also had lab and  
21 chemistry testing done to see if she showed those  
22 markers for dehydration; correct?

23 A. Yes.

24 Q. And you are aware that she -- her results  
25 also came back with no dehydration?

1 **A. Look at the numbers real quick.**

2 **Q.** I might have misspoken, Doctor. If you  
3 look at Bates stamp 2087 --

4 **A. One page is missing out of here.**

5 **Q.** And I'll direct you --

6 **A. Sodium and chloride are normal with an  
7 elevated BUN.**

8 **Q.** Okay. And so that indicates to you mild  
9 dehydration; is that correct?

10 **A. Yeah. It's minor renal insufficiency.  
11 It's a number that usually corresponds with the  
12 creatinine we talked about before.**

13 **Q.** Okay. So what is it? Is she dehydrated,  
14 or is that number of the BUN related to the renal  
15 failure?

16 **A. It's related to the renal failure, which  
17 could mean -- for some reason the renal function is  
18 not normal, which could be from dehydration.**

19 **Q.** Okay. So the other markers showed  
20 normal; is that correct?

21 **A. Yeah. The electrolytes were normal.**

22 **Q.** If you look on the second page of the lab  
23 results, Bates stamp 2088, the UA specific gravity,  
24 which we talked about is another marker, is also  
25 normal; correct?

1 **A. Yes.**

2 **Q.** Going back to Dr. Earl's ER evaluation of  
3 Ms. Spencer, the last thing he wrote was additional  
4 considerations would be other sedative hypnotic  
5 intoxication.

6 She does not fit any other obvious other  
7 toxidrome; correct?

8 **A. Yes.**

9 **Q.** And you would agree with me that, based  
10 upon Dr. Earl's evaluation, he, like you, were  
11 looking at this and thinking this is a puzzle, a  
12 toxidrome; correct?

13 **A. That was in the differential for sure.  
14 Yes.**

15 **Q.** And do you recall whether or not that was  
16 specifically discussed between you, Dr. Earl and  
17 the other doctors?

18 **A. I think we discussed similar to what we  
19 have been now, is just that we were -- you know --  
20 we did specifically discuss those finding of the  
21 small pupils and tachycardia and the high  
22 temperature in some of the cases but not all of the  
23 cases.**

24 **Q.** Okay. Going to this last paragraph that  
25 Mr. Hughes showed you, consideration also regarding

1 the possibility of a cholinergic overdose with her  
2 relatively miotic pupils. And that's what we've  
3 been discussing; correct?

4 **A. Yes.**

5 **Q.** And cholinergic includes  
6 organophosphates; correct?

7 **A. Yes.**

8 **Q.** She -- Dr. Earl wrote, she had no  
9 excessive salivation; correct?

10 **A. Yes.**

11 **Q.** Now, if Dr. Earl or you, being the ICU  
12 doctor, had received information that Ms. Spencer  
13 at the scene on October 8 when she was pulled out  
14 of the sweat lodge had foaming at the mouth, that  
15 would be considered excessive salivation or  
16 secretion; correct?

17 **A. Yes. I'm just stuck with the information  
18 from the physicians I talked to. But that's  
19 potentially important information.**

20 **Q.** And I understand, Doctor. Again, I'm not  
21 questioning your care. You did what you did on  
22 the information you had. But if someone had frothy  
23 sputum or excessive salivation, foaming at the  
24 mouth, that would be information that would be  
25 consistent with a cholinergic overdose or exposure;

1 correct?

2 **A. It would be. But when we're specifically  
3 considering giving antidotes or not, it's important  
4 to see persistent symptoms at that time. And if  
5 the symptoms had resolved, that would also not  
6 affect what we were doing if they used to have  
7 excessive salivation. It wouldn't make me want to  
8 give an antidote to somebody who no longer has  
9 symptoms but might have had symptoms a while ago.**

10 **We already have an airway, and we're  
11 already protecting them and hydrating them and  
12 doing a lot of things at that point, which are  
13 going to be the -- really the foundation of the  
14 treatment.**

15 **If there were persistent symptoms to  
16 suggest cholinergic overdose, then it's almost --  
17 the physical exam at that time was as important.**

18 **Q.** Understood. So in terms of your  
19 decisions regarding what care to give these  
20 patients, you would want to see the symptoms  
21 persist when you give that care; correct?

22 **A. Yeah. A lot of the approach we're having  
23 to looking and see if there is ongoing symptoms  
24 that we can do something to help.**

25 **Q.** Got it.



1 **A. And if they're not ongoing, the reality**  
 2 **is, just from our immediate treatment perspective,**  
 3 **if there was something a while ago that's resolved,**  
 4 **that's not pertinent really to our ongoing**  
 5 **resuscitation of people that are very sick.**

6 **Q.** Okay. What I want to try and do with  
 7 you, Doctor, is to separate out -- and, again, I  
 8 can't repeat it enough. I'm not questioning your  
 9 care -- is to separate that out. And because  
 10 Mr. Hughes has asked you about probable causes. If  
 11 somebody is foaming at the scene like Sidney  
 12 Spencer was and the other --

13 **MR. HUGHES:** Objection, Your Honor. Misstates  
 14 the evidence.

15 **THE COURT:** What the lawyers say, of course,  
 16 is not evidence, ladies and gentlemen. I have said  
 17 that before. So questions will be phrased, and you  
 18 have to rely on your recollection as to what  
 19 actually was the evidence.

20 So you may phrase a question.

21 **MS. DO:** Thank you.

22 **Q.** If a doctor who -- medical doctor at the  
 23 scene describes seeing Sidney Spencer foaming at  
 24 the mouth, putting your treatment and care aside,  
 25 that is a factor, a physical manifestation, that

1 would be consistent with bronchorrhea; correct?

2 **A. Foaming is consistent with the**  
 3 **cholinergic process.**

4 **Q.** All right. Thank you. Now, so, at the  
 5 time that Dr. Earl wrote this, that she had no  
 6 excessive salivation -- and I cut it off. But he  
 7 continues on to say that she does not fit any other  
 8 obvious toxidrome. That's a conclusion reached  
 9 without that piece of fact or information; correct?

10 **A. Yes. That was on his current exam, I**  
 11 **think.**

12 **Q.** The final diagnosis that Dr. Earl reached  
 13 before he turned her over to your care, Doctor --  
 14 if you could refer to page 2086 of yours.

15 **A. Okay.**

16 **Q.** And do you recall whether or not Sidney  
 17 Spencer once admitted on October 8 was discharged  
 18 within 24 hours?

19 **A. She was discharged on October 13.**

20 **Q.** October 13. Okay. So here the final  
 21 diagnosis of Dr. Earl is coma of unclear etiology;  
 22 correct?

23 **A. Yes.**

24 **Q.** Meaning he doesn't know what's causing  
 25 her coma?

1 **A. Correct.**

2 **Q.** The second thing is respiratory failure.  
 3 Third is metabolic acidosis. And fourth is  
 4 evidence of mild transaminase elevation. Can you  
 5 tell me what that is.

6 **A. It's a liver function test.**

7 **Q.** Say that one more time.

8 **A. Liver function test.**

9 **Q.** All right. And so these last three  
 10 things -- the respiratory failure, the metabolic  
 11 acidosis, and the fourth, the failure, is  
 12 nonspecific to heat stroke; correct?

13 **A. Correct.**

14 **Q.** And, again, there is no mention by  
 15 Dr. Earl upon seeing her, first doctor to put eyes  
 16 on her -- he doesn't say heat stroke; correct?

17 **A. No.**

18 **Q.** Or heat illness; correct?

19 **A. Correct.**

20 **Q.** Now, I understand that when Ms. Spencer  
 21 came in, she had been intubated on the field, put  
 22 on a ventilator. She was extubated within three  
 23 hours of presentation? Is that correct?

24 **A. She became responsive after I admitted**  
 25 **and I extubated her.**

1 **Q.** And do you know whether or not that was  
 2 within three hours of her admission?

3 **A. I don't know exactly what time she was**  
 4 **extubated. My comment here is it was early in the**  
 5 **morning. It was probably -- definitely between**  
 6 **midnight and 6:00 a.m. on the 9th.**

7 **Q.** Can I have you take a look, then, at  
 8 Bates stamp 2105.

9 Do you see information there of when she  
 10 was extubated?

11 **A. Says here she was extubated at 10:45 p.m.**  
 12 **on the 8th.**

13 **Q.** Okay. So --

14 **A. That would have been within a few hours**  
 15 **of arriving.**

16 **Q.** She arrived at 7:55 and was examined by  
 17 Dr. Earl in a comatose -- in a deep coma; correct?

18 **A. That's what he said. Yes.**

19 **Q.** Okay. And she then was transferred to  
 20 ICU. And at 10:45 she was extubated, meaning she's  
 21 now breathing on her own and she's responsive;  
 22 correct?

23 **A. Yes.**

24 **Q.** And that's less than three hours?

25 **A. Yes.**

1 Q. Her temperature was taken, and I know it  
2 was a tympanic temperature. Dr. Earl took a  
3 tympanic temperature at 7:55, and she was  
4 96.8 degrees Fahrenheit or 36 degrees Celsius;  
5 correct?

6 A. Yes.

7 Q. And that's actually below normal; is that  
8 correct?

9 A. Correct.

10 Q. So that's something we call  
11 "hypothermic"?

12 A. Mildly so. But yes.

13 Q. Okay. And then at 8:31 there was a  
14 rectal temperature that was taken, and her rectal  
15 temperature was 36.7 degrees Celsius which, is  
16 98.06 Fahrenheit; correct?

17  
18 A. That's close. I'm not sure of the exact  
19 numbers.

20 Q. Fair enough. But below normal; correct?

21 A. Yes.

22 Q. Okay. So in addition to not having -- in  
23 addition to having below normal temperature, this  
24 is a patient who came in, was comatose, and within  
25 three hours was breathing on her own and

1 responsive; is that correct?

2 A. Yes.

3 Q. And that was part of the piece of this  
4 puzzle for you and Dr. Earl; correct?

5 A. I mean I think yes and no. There was --  
6 I think a lot of the reason for intubation was the  
7 unresponsiveness and the airway protection. So  
8 when she was awake and could show us she could  
9 protect her airway, there wasn't reason to continue  
10 the intubation. So that's really what I saw.

11 And I just assessed her, if she's awake  
12 and following commands, looked at her X-rays.  
13 There wasn't any reason why she shouldn't do well  
14 with her breathing when we took her off. But that  
15 was a change. Obviously from the time she was  
16 intubated, that wasn't the case.

17 So I think the biggest change that we saw  
18 during that period of time probably wasn't in her  
19 respiratory function but was in her mental status  
20 had improved.

21 Q. Okay. Taking both of those, let me ask  
22 you this question: We earlier talked about  
23 respiratory failure in the cases of heat stroke  
24 being a late-stage finding; correct?

25 A. Yes.

1 Q. And here you have a patient coming in in  
2 a deep coma, not breathing on her own, and then  
3 it's like whatever affect she was under wore off in  
4 less than three hours; correct?

5 A. Yes.

6 Q. And that was something that presented as  
7 a puzzle to Dr. Earl and to you; correct?

8 A. To an extent. I think it's just -- the  
9 big thing was that there was something that was  
10 compromising her at the time that was resolved, and  
11 it may have been removing her from whatever  
12 situation she was that did that also.

13 There was some reason she was  
14 unresponsive at the time, and that did change. I  
15 don't think -- it wasn't really mystery in that if  
16 she would have had pneumonia or had something  
17 happen to her lungs, that wouldn't have resolved in  
18 three hours.

19 But I think that emphasizes the point  
20 that she was intubated for airway protection and  
21 not respiratory failure.

22 Q. Okay.

23 A. And then -- so she wasn't being  
24 ventilated at that time, but it wasn't primarily a  
25 lung problem that was the issue. And so once she

1 did wake up and could protect her airway, that's  
2 when she could come off.

3 Q. The bigger concern, as you said, was her  
4 mental status, that being that she was in a coma;  
5 correct?

6 A. Yes.

7 Q. And, again, whatever that caused her to  
8 be in that deep coma, it's as if it wore off in  
9 three hours?

10 A. Yes.

11 Q. Correct? And with heat stroke, when you  
12 normally find respiratory failure in a late stage,  
13 that's after a lot of other damage has occurred to  
14 the body; correct?

15 A. Yes. But I guess the unresponsiveness --  
16 that's the question. What was the unresponsiveness  
17 from?

18 Q. Now, let me move to Tess Wong. If you  
19 could put Exhibit 396 in front of you.

20 Ms. Wong came into the emergency room at  
21 Flagstaff medical at 8:05 p.m.; correct?

22 A. First vital signs are recorded then.

23 Yes.

24 Q. And she was also unresponsive, in a  
25 comatose state?

1 **A. Yes.**  
 2 **Q.** Like Sidney Spencer and Liz Neuman?  
 3 **A. Similar. Yes.**  
 4 **Q.** She was discharged on October 14, 2009;  
 5 correct?  
 6 **A. Yes.**  
 7 **Q.** And her being hospitalized for that many  
 8 days had more to do with the fact that she had a  
 9 lung collapse during intubation in the field;  
 10 correct?  
 11 **A. I think she was -- the biggest issue that**  
 12 **she was intubated for an extra day is they had**  
 13 **difficulty getting an airway tube in. And there**  
 14 **was a high concern that there would be a lot of**  
 15 **swelling. If we would take the tube out**  
 16 **immediately after with the swelling, she could**  
 17 **struggle with her breathing just from trauma to the**  
 18 **airway.**  
 19 **So she did wake up as well and was**  
 20 **following commands, but we left her intubated for**  
 21 **an extra day and gave her medication to reduce**  
 22 **swelling before we extubated.**  
 23 **Q.** Okay.  
 24 **A.** And there also wasn't the cuff -- I  
 25 talked about when we put that tube in, there is a

1 cuff that comes up in the throat that seals it  
 2 tightly. It's an indication to us that there is a  
 3 lot of swelling if we reduce the cuff and we can't  
 4 hear any air leaking around it.  
 5 **Normally there should be some air leaking**  
 6 **around. And when there isn't, it suggests**  
 7 **potential swelling. Those are the two reasons I**  
 8 **left her intubated that night. And she did come**  
 9 **off the vent 24 hours after that.**  
 10 **Q.** Okay. Again, like Sidney Spencer, she  
 11 came in in a comatose state, and whatever was  
 12 causing that wore off within the time period you  
 13 just described; correct?  
 14 **A. Yes. She was awake and following**  
 15 **commands quickly.**  
 16 **Q.** Quickly. And so my question, then, is  
 17 the fact that she remained in the hospital for  
 18 those many days to October 14 had more to do with  
 19 the complications of the lung collapsing during  
 20 intubation; correct?  
 21 **A. I think the reasons were -- the lung**  
 22 **collapse wasn't the issue. That was reexpanded**  
 23 **within a couple hours also. The lung collapse**  
 24 **doesn't end up being a big issue if it reexpands**  
 25 **right away. And it did. So it's the repositioning**

1 **of the tube allows the lung to reexpand. So it**  
 2 **wasn't permanent damage to the lung.**  
 3 **So that really was probably a trivial**  
 4 **point. It was something we did know when she came**  
 5 **in, but that didn't prolong her hospital stay. The**  
 6 **swelling was the bigger issue. That definitely**  
 7 **gave her an extra 24 hours on the vent.**  
 8 **She also had renal failure and some**  
 9 **elevated liver tests. So I think that's why she**  
 10 **stayed in the hospital for several days.**  
 11 **Q.** Thank you. Let's talk about her vitals  
 12 when she came in at 8:05 to the ER. She had a  
 13 temperature that was taken -- a tympanic  
 14 temperature. And, again, that temperature was  
 15 below normal; correct?  
 16 And I'm looking at Exhibit 396, Bates  
 17 stamp 2917?  
 18 **A. Yes. It was 35.1.**  
 19 **Q.** Okay. And do you know if 35.1 is 95.18  
 20 degrees Fahrenheit?  
 21 **A. Yes. That sounds correct.**  
 22 **Q.** Okay. And I understand tympanic is when  
 23 you take the measurements through the ear.  
 24 Correct?  
 25 **A. Yes.**

1 **Q.** And that typically is less accurate than  
 2 a rectal temperature; correct?  
 3 **A. Yes.**  
 4 **Q.** But it's usually how many degrees off?  
 5 **A. Should be within two degrees probably.**  
 6 **Q.** She also had labs done on her to see  
 7 whether or not she had clinical evidence of  
 8 dehydration; correct?  
 9 **A. Yes.**  
 10 **Q.** And her labs came back showing that she  
 11 also had no clinical evidence of dehydration;  
 12 correct? And I can refer you to Bates stamp 2164.  
 13 **A. Sodium and chloride were normal. Her BUN**  
 14 **was upper limits of normal. Creatinine was a**  
 15 **little bit high, kind of upper limits of normal**  
 16 **levels. The electrolytes were normal.**  
 17 **Q.** Okay. And that includes the chloride;  
 18 correct?  
 19 **A. Yes.**  
 20 **Q.** Now, she showed an elevated glucose level  
 21 of 177. Do you see that?  
 22 **A. Yes.**  
 23 **Q.** Do you know whether or not an elevated  
 24 glucose level -- and that's blood sugar; correct?  
 25 Blood in the sugar?

- 1 **A. Yes.**
- 2 **Q.** Sugar in the blood. That is also
- 3 something that you would see in a cholinergic
- 4 toxidrome -- a transient glucose level?
- 5 **A. I guess you could. That's kind of an**
- 6 **upper limits of normal. Higher than you'd expect,**
- 7 **but it's not that abnormal too. You could have a**
- 8 **temporary higher glucose level.**
- 9 **Q.** Were there any reasons for Ms. Wong
- 10 having that elevated glucose level? For example,
- 11 was she diabetic, if you know?
- 12 **A. I don't have it on these records. If**
- 13 **there was a hemoglobin A1C drawn, that would**
- 14 **clarify that.**
- 15 **Q.** Okay. If she didn't have those
- 16 conditions to explain the glucose level, you would
- 17 agree a temporary increase or elevated glucose
- 18 level can be consistent with a cholinergic
- 19 toxidrome; correct?
- 20 **A. Yes. It's nonspecific as well. But yes.**
- 21 **Q.** Understood. With respect to Ms. Wong and
- 22 everything that she presented with, she also, like
- 23 Ms. Spencer, all of these issues resolved on its
- 24 own; correct?
- 25 **A. Yes.**

- 1 **Q.** The respiratory failure completely
- 2 resolved?
- 3 **A. Yes.**
- 4 **Q.** Her renal function completely normalized;
- 5 correct?
- 6 **A. Yes.**
- 7 **Q.** And so similar to Ms. Spencer, whatever
- 8 was causing these things, it was almost as if it
- 9 wore off; is that correct?
- 10 **A. Yes. But there was -- I think there were**
- 11 **some more issues with Ms. Wong than there was with**
- 12 **Mrs. Spencer and that we were seeing progressive**
- 13 **increase in the creatine kinase, suggesting**
- 14 **rhabdomyolysis for a while. Which did ultimately**
- 15 **correct.**
- 16 **There were some things more concerning in**
- 17 **her case comparing the two. She was in the**
- 18 **hospital a little bit longer because there were**
- 19 **more renal and liver issues that we were monitoring**
- 20 **more closely for a while. She had to be hydrated**
- 21 **for a longer period of time. But they did resolve,**
- 22 **I would say.**
- 23 **Q.** And all those conditions you described
- 24 are nonspecific to heat stroke; correct?
- 25 **A. Yes.**

- 1 **Q.** The muscle breakdown, the renal failure.
- 2 You can see those in cases of a cholinergic
- 3 toxidrome; correct?
- 4 **A. Yeah. Or being found down for whatever**
- 5 **reason.**
- 6 **Q.** All right. With respect to Ms. Wong,
- 7 your critical care evaluation of her, you also
- 8 noted she had pinpoint pupils; correct?
- 9 **A. Yes.**
- 10 **Q.** Let me turn to that. If you -- do you
- 11 have your critical care evaluation in front of you,
- 12 Doctor?
- 13 **A. Yes.**
- 14 **Q.** And we're looking at Bates stamp 2155 to
- 15 2158. I'm going to focus you on the assessment and
- 16 plan that's found on your page 3.
- 17 **A. Okay.**
- 18 **Q.** What's the exhibit number you have in
- 19 front of you? Is that 396?
- 20 **A. Yes.**
- 21 **Q.** So after you and Dr. Earl evaluated her,
- 22 you wrote this report called the "critical care
- 23 evaluation"; correct?
- 24 **A. Yes.**
- 25 **Q.** And your critical care evaluation of her

- 1 contained a number of diagnoses. Respiratory
- 2 failure; correct?
- 3 **A. Yes.**
- 4 **Q.** Right upper lobe collapse; correct?
- 5 **A. Yes.**
- 6 **Q.** Acute renal insufficiency; correct?
- 7 **A. Yes.**
- 8 **Q.** And hypotension?
- 9 **A. Yes.**
- 10 **Q.** That's low blood pressure?
- 11 **A. Yes.**
- 12 **Q.** Nowhere in your assessment or plan after
- 13 evaluating Ms. Wong after she was also seen by
- 14 Dr. Earl did you indicate heat stroke; correct?
- 15 **A. Not in this report. No.**
- 16 **Q.** Or heat illness; correct?
- 17 **A. Correct.**
- 18 **Q.** When you said "not in this report," is
- 19 there another report where you mentioned heat
- 20 stroke?
- 21 **A. Just hard to make a comment based on**
- 22 **every report at one time. I would say I'm not**
- 23 **aware of making it in another one either.**
- 24 **Q.** Perhaps Mr. Hughes can point that out if
- 25 there is one. But based upon the report we have in

1 front of us, no mention of the heart stroke;  
2 correct?  
3 **A. Yes.**  
4 **Q.** Now, I know that you did not personally  
5 treat Mr. Ray. But you had indicated earlier that  
6 because all four patients presented critically ill  
7 with similar signs and symptoms, this was a puzzle  
8 to you and the other doctors. He was also in that  
9 equation when you talked about what was going on;  
10 correct?

11 **A. Yes.**

12 **Q.** Meaning Stephen Ray was a patient that  
13 was discussed by you and the other doctors trying  
14 to figure out this puzzle; correct?

15 **A. To some extent I had my hands full with  
16 the other three at the time so --**

17 **Q.** I appreciate that. Let me have you,  
18 then, look at Exhibit 213, which has already been  
19 admitted.

20 **A. Okay.**

21 **Q.** And the doctor who is -- according to the  
22 records the attending doctor is a Dr. Richard Neff;  
23 correct?

24 **A. Yes. But he wouldn't have been the  
25 admitting physician.**

1 **Q.** Okay. The admitting physician was the ER  
2 doctor, Dr. Jeffrey Daniel; is that right?

3 **A. Or potentially Dr. Tuttle from our group  
4 was the admitting.**

5 **Q.** Okay. Why don't we take a look at the  
6 emergency department evaluation. And then we're  
7 almost done here, Doctor.

8 **A. Okay.**

9 **Q.** If I can refer you to Bates stamp 7093.

10 **A. Okay.**

11 **Q.** And just so that we're complete, the  
12 report actually starts on 7091; correct?

13 **A. Yes.**

14 **Q.** The time that he was seen by the ER  
15 doctor, that would be Dr. Jeffrey Daniel, was  
16 6:30 p.m. on October 8; correct?

17 **A. Correct.**

18 **Q.** Is that yes?

19 **A. Yes.**

20 **Q.** Okay. And he presented with a chief  
21 complaint of altered mental status and seizure; is  
22 that correct?

23 **A. Yes.**

24 **Q.** After Dr. Daniel evaluated Mr. Ray, he  
25 was then turned over to your -- I'm sorry. Turned

1 over to Dr. Neff. Does that sound right to you?

2 **A. It mentions in the note that he was  
3 initially transitioned to Dr. Tuttle, at the bottom  
4 of the note. I think that's who he transition care  
5 to.**

6 **Q.** Okay. Is Dr. Tuttle in the ICU?

7 **A. He's one of my partners.**

8 **Q.** Let me turn to page 7093 where there is  
9 an emergency department course in medical decision  
10 making paragraph?

11 **A. Okay.**

12 **Q.** And here, like the other patients that  
13 we've discussed, Dr. Daniel was also taking about a  
14 toxidrome; correct?

15 **A. Yes.**

16 **Q.** Among other diagnoses; correct?

17 **A. Correct.**

18 **Q.** So the acute carbon monoxide poisoning --  
19 that was ruled out?

20 **A. Yes.**

21 **Q.** And Mr. Ray presented in the ER with,  
22 again, like the other patients, pinpoint pupils;  
23 correct?

24 **A. I'm not sure to comment on it. I never  
25 examined Mr. Ray. I never saw him.**

1 **Q.** Okay. According to these records. Which  
2 are in evidence, did you note or do you note moist  
3 skin and pinpoint pupils?

4 **A. Dr. Daniel's note just says that they're  
5 equal and reactive to light. Having not examined  
6 him, I'm just depending on -- I can confirm what's  
7 written on this piece of paper, but I didn't see  
8 the patient.**

9 **Q.** I understand. Are you on Bates stamp  
10 7093?

11 **A. Yes.**

12 **Q.** Okay. And looking at that, do you see  
13 what I've highlighted, moist skin and pinpoint  
14 pupils?

15 **A. Yes, in that location. In the other spot  
16 it just says they were reactive. I see that here.**

17 **Q.** Okay. Does reactive exclude pinpoint  
18 pupils?

19 **A. No, it doesn't.**

20 **Q.** Okay. And here, moist skin. Again, that  
21 would be consistent with what we talked about in  
22 terms of a cholinergic toxidrome; correct? The  
23 opposite of dry as a bone?

24 **A. Yes.**

25 **Q.** Mr. Ray also had, according to

1 Dr. Daniel, seizures or evidence of seizures;  
2 correct?

3 **A. Yes.**

4 **Q.** And, again, that is something that you  
5 might see consistent with a cholinergic toxidrome;  
6 correct?

7 **A. Probably either cholinergic or  
8 anticholinergic could have a seizure.**

9 **Q.** Both toxidromes?

10 **A. Yes.**

11 **Q.** Okay. And like the other doctors,  
12 Dr. Daniel was also talking about an  
13 anticholinergic toxidrome because of the pupils; is  
14 that correct?

15 **A. Yes.**

16 **Q.** But in this case because they were  
17 pinpoint, the correct toxidrome would be a  
18 cholinergic toxidrome; correct?

19 **A. Except, as he suggested, the things  
20 consistent with the anticholinergic were the  
21 tachycardia, hypothermia and hypertension, which  
22 would be -- as we talked about, there is kind of a  
23 mix in, muscarinic and nicotinic. But classically  
24 that's called an "anticholinergic." And that's the  
25 thing that was -- that didn't correlate there with**

1 **the pupils.**

2 **Q.** Okay. Understood. Let me -- the last  
3 thing I'm going to have you look at, Doctor, is  
4 Dr. Neff's notes taken on October 11. And you will  
5 find that at Bates stamp 7095.

6 **A. Okay.**

7 **Q.** And you would agree with me that this is  
8 Dr. Neff's evaluation on October 11, 2009,  
9 approximately three days after Mr. Ray was admitted  
10 on the 8th; correct?

11 **A. Yes.**

12 **Q.** And in this particular evaluation by  
13 Dr. Neff, he indicated that Mr. Ray was reporting  
14 signs of the world spinning; correct?

15 **A. Yes.**

16 **Q.** Double vision; correct?

17 **A. Yes.**

18 **Q.** And it's true, is it not, that in the  
19 case of a cholinergic toxidrome, you're going to  
20 see evidence of blurred vision and vertigo?

21 **A. You can. Yes.**

22 **Q.** And the same report after evaluating  
23 Mr. Ray, this doctor wrote at paragraph 2, the  
24 patient does not appear to have had heat stroke;  
25 correct?

1 **A. Which page are you on there?**

2 **Q.** Let me highlight that. We're on Bates  
3 stamp 7095 down at assessment and plan.

4 **A. I'll confirm that's what Dr. Neff said in  
5 his note. Yeah.**

6 **Q.** Okay. And he's ruled out carbon monoxide  
7 poisoning; correct?

8 **A. Carbon monoxide. It's written both ways  
9 in the note. But carbon monoxide is a concern.  
10 Yes.**

11 **Q.** Okay. He also indicated the patient does  
12 not appear to have had heat stroke?

13 **A. That's what he indicated. Yes.**

14 **Q.** Did you ever speak to Dr. Neff about his  
15 conclusion there?

16 **A. No, I didn't. I wasn't involved in any  
17 of the care on this patient.**

18 **Q.** What about Dr. Kennedy, Emmalee Kennedy?  
19 Do you recall ever speaking to her in this  
20 collaboration in trying to figure out this puzzle?

21 **A. I didn't speak with either of them during  
22 this. I wasn't involved with them.**

23 **Q.** If I can have you then -- and this is the  
24 final questions on Mr. Ray -- take a look at Bates  
25 stamp 7097.

1 **A. Okay.**

2 **Q.** And this, again, is about Mr. Ray, but  
3 it's an evaluation by yet a third doctor; correct?

4 **A. Yes. One of Dr. Neff's partners.**

5 **Q.** And Dr. Emmalee Kennedy -- and this was  
6 an examination conducted on October 10, 2009;  
7 correct?

8 **A. Yes.**

9 **Q.** And Dr. Kennedy also upon her evaluation  
10 of Mr. Ray noted that Mr. Ray said he was having  
11 triple vision; correct?

12 **A. Yes.**

13 **Q.** And a sense of the world spinning?

14 **A. Yes.**

15 **Q.** Both consistent with a cholinergic  
16 toxidrome; correct?

17 **A. Potentially. One thing. This is several  
18 days out now. And Dr. Neff also considered a  
19 possible anoxic brain injury as the cause.**

20 **Q.** Okay.

21 **A. We're several days into it. I wouldn't  
22 expect any drug to be in the system three days or  
23 four days out.**

24 **Q.** Understood. But the observation is  
25 consistent; correct?

1 **A. The observation. Yes.**

2 **Q.** Dr. Kennedy, like Dr. Neff, also  
3 indicated in this particular report -- and I'll  
4 have you turn to page 7098, please.

5 Dr. Kennedy on October 10, observing and  
6 examining Mr. Ray, consistent with Dr. Neff, also  
7 wrote, this patient does not appear to have had  
8 heat stroke; correct?

9 **A. That's what she documented. Yes.**

10 **Q.** My question to you, Doctor, is -- I'm  
11 going to wrap this up. I know we've gone through a  
12 lot of information. I just want to summarize. Is  
13 that you had four critical patients come in all  
14 with pinpoint pupils; correct?

15 **A. Yes.**

16 **Q.** And you weren't told, but I want you to  
17 assume that the evidence in this case is that all  
18 four of these folks, in addition to the other two  
19 that died, were seen at the incident with foaming  
20 or frothy sputum. Okay?

21 Liz Neuman was noted to have, as you  
22 indicated in the records, by the paramedics to have  
23 cool and clammy skin; correct?

24 **A. Yes.**

25 **Q.** And as you saw with Mr. Ray, he was also

1 noted to have moist skin and pinpoint pupils;  
2 correct?

3 **A. Yes.**

4 **Q.** They all presented with respiratory  
5 failure; correct?

6 **A. They were all intubated at least. Yes.**

7 **Q.** Okay. Respiratory failure with the  
8 foaming; correct?

9 **A. I don't know that they all had foaming.**

10 **Q.** I want you to assume that, then. If the  
11 evidence in this case is that they all had foaming,  
12 that's considered in connection with the  
13 respiratory failure, the killer bees that we talked  
14 about, the bronchorrhea; correct?

15 **A. I don't understand the question.**

16 **Q.** It's poorly worded.

17 **A. I don't agree that they were all foaming.**

18 **Q.** Because you don't know?

19 **A. If you're just saying the patients are  
20 foaming, you're creating a scenario, that's fine.**

21 **Q.** Okay. Thank you. That's correct. If  
22 you were told during the time that you had  
23 Ms. Neuman those nine days in your care that she  
24 and the other three critically ill and the other  
25 two decedents had frothy sputum, that's a fact you

1 would have considered; correct?

2 **A. Yes.**

3 **Q.** You were never told by anyone that there  
4 was a statement that night by a first responder  
5 that somebody has suspected organophosphates at the  
6 scene; correct?

7 **A. Correct.**

8 **Q.** And that information could have allowed  
9 you to either preserve samples or send them out for  
10 testing; correct?

11 **A. Correct.**

12 **Q.** Now, given all these indications, Doctor,  
13 as you sit here before this jury, can you tell them  
14 with certainty that you can rule out  
15 organophosphates?

16 **A. I can't say I can rule it out with  
17 certainty. No.**

18 MS. DO: Thank you, Your Honor.

19 Thank you, Doctor.

20 THE COURT: Thank you, Ms. Do.

21 Mr. Hughes.

22 MR. HUGHES: Thank you, Your Honor.

23 REDIRECT EXAMINATION

24 BY MR. HUGHES:

25 **Q.** Doctor, I realize it's 4:00. And you

1 indicated in the break you have to be in Flagstaff  
2 at the hospital at what time?

3 **A. About 6:00 o'clock or so.**

4 **Q.** And what time do you need to leave to  
5 make it to the hospital?

6 **A. Oh, hopefully before 5:00 if that's  
7 possible.**

8 **Q.** We'll do our best.

9 Doctor, you've been asked a number of  
10 questions about cholinergic and anticholinergic  
11 and other forms of toxidromes. Can you tell us, if  
12 you would, what the classic -- specifically you  
13 were asked about organophosphates poisoning. Do  
14 you recall that?

15 **A. Yes.**

16 **Q.** And would organophosphates poisoning be  
17 a -- what sort of toxidrome would that be?

18 **A. Cholinergic.**

19 **Q.** So organophosphates poisoning is  
20 cholinergic?

21 **A. Yes.**

22 **Q.** Can you tell us what the classic signs  
23 and symptoms of a cholinergic --

24 **A. As we've talked about, there is a bit of  
25 a mixed picture with nicotinic and muscarinic**

1 **receptors. The muscarinic can be nausea, vomiting,**  
 2 **diarrhea, abdominal cramping, small pupils,**  
 3 **bradycardia and then moist mucosa and sweating.**

4 **Q.** So we've got nausea and vomiting. What  
 5 did you have after that?

6 **A. Abdominal cramping.**

7 **Q.** Okay.

8 **A. Miosis or the small pupils, bradycardia.**

9 **Q.** What is bradycardia again?

10 **A. Slow heart rate. And then just moist**  
 11 **mucosa and sweating. And then the variable with**  
 12 **the nicotinic. We talked about there could be some**  
 13 **potential faster heart rate responses with those**  
 14 **receptors or higher blood pressure?**

15 **Q.** And nicotinic is a form of a  
 16 cholinergic toxin?

17 **A. Well, there is two receptors on the --**  
 18 **the organophosphates affect two muscle receptors,**  
 19 **which is a nicotinic and a muscarinic. Just kind**  
 20 **of a complex response it has.**

21 **Q.** So is that in every case or is that just  
 22 a possibility?

23 **A. The acetylcholine affects both of them.**

24 **Q.** Okay. But you listed some nicoteric  
 25 (sic) factors that you said it could be. Would

1 those be factors that you would ordinarily see in a  
 2 cholinergic toxin?

3 **A. It can be a little bit of a mixed**  
 4 **picture, but I would say the predominant would be**  
 5 **what we read.**

6 **Q.** Okay. What are the other possible  
 7 factors that you mentioned?

8 **A. Well, with the nicotinic it's**  
 9 **specifically the increased blood pressure. And**  
 10 **could be tachycardia instead of bradycardia, also a**  
 11 **lot of muscle fasciculation.**

12 **Q.** You said muscle --

13 **A. Fasciculation.**

14 **Q.** Could you tell me what that would mean.

15 **A. Kind of twitching. It's affecting the**  
 16 **muscle response. You will see twitching in big**  
 17 **muscles.**

18 **Q.** Okay. Now, on these factors that we've  
 19 discussed, the nausea and vomiting -- is that  
 20 something that you would also expect to see in some  
 21 patient who is suffering from heat stroke?

22 **A. In heat stroke, yes.**

23 **Q.** And how about the abdominal cramps?

24 **A. You can see that with heat stroke as**  
 25 **well. Yes.**

1 **Q.** How about the small pupils?

2 **A. I would say there is not a specific pupil**  
 3 **response with the heat stroke.**

4 **Q.** In other words, is it possible heat  
 5 stroke could cause you to have wide pupils?

6 **A. I don't know of anything specific with**  
 7 **heat stroke that's going to cause a pupil change.**

8 **Q.** Okay. Would the fact that a patient  
 9 presents with small pupils then rule out the  
 10 possibility that they could have heat stroke?

11 **A. I don't think so.**

12 **Q.** And can you explain why.

13 **A. I don't have a clear -- I don't have a**  
 14 **direct textbook explanation for it. I think there**  
 15 **are a lot of things that are going on with people**  
 16 **that are critically ill. Particularly if there is**  
 17 **other anoxic brain issues and things going on, it**  
 18 **can affect that. It's not a classic finding, I**  
 19 **would say, to have small pupils with heat stroke,**  
 20 **but it doesn't exclude it.**

21 **Q.** You mentioned anoxic brain injury. Would  
 22 you expect -- would a person presenting with heat  
 23 stroke, would you expect to have them suffering  
 24 from an anoxic brain injury?

25 **A. Again, that's just referring to the**

1 **spectrum of an event. It it's a very server case,**  
 2 **they could be. They wouldn't necessarily have**  
 3 **that, though.**

4 **Q.** Moist mucosa. Is that something you  
 5 would expect to see in heat stroke?

6 **A. I would not expect to see with heat**  
 7 **stroke. You expect to be more dehydrated.**

8 **Q.** And sweating?

9 **A. You know, initially you are going to be**  
 10 **sweating and trying to compensate. I think the**  
 11 **issue with the heat stroke is there is a point**  
 12 **where you become decompensated. But I think if**  
 13 **you've become dehydrated, you might stop sweating.**  
 14 **Your normal response would be to sweat with heat**  
 15 **exposure.**

16 **Q.** You said possible other factors that you  
 17 might see if it's one of those nicoteric (sic)  
 18 forms of the toxidrome would be an increased blood  
 19 pressure? Is that correct?

20 **A. Yes. I would say I would not to expect**  
 21 **to see that with heat stroke.**

22 **Q.** What about a patient who gets intubated,  
 23 a heat stroke patient who is intubated? Would you  
 24 expect to see any change in their blood pressure?

25 **A. Again, that just complicates things**



1 considerably depending on what other medications  
2 they've had. Because oftentimes after they're  
3 intubated, we sedate them. And that lowers blood  
4 pressure. Depending on which sedation, if there's  
5 a paralytic or not, and they're coming off it and  
6 they're not sedated, it can increase with  
7 agitation.

8 So you have to have some real specific  
9 time frames of exactly what drugs were given when  
10 and what's happening under those circumstance. You  
11 can kind of see a huge spectrum of vital signs that  
12 come in with people that are in this kind of  
13 condition because there's a lot of things that are  
14 going on.

15 Q. And then tachycardia. That's a fast  
16 heart rate; correct?

17 A. Yes.

18 Q. Would you expect -- what sort of a heart  
19 rate would you expect to see, then, if the person  
20 was suffering from that special subset of a  
21 cholinergic toxidrome?

22 A. In that case a faster heart rate if it's  
23 nicotinic. The typical -- the cholinergic response  
24 is bradycardic.

25 Q. And then tachycardia. Is that something

1 you would expect to see in a patient suffering from  
2 heat stroke?

3 A. Yes.

4 Q. Why is that?

5 A. Typically with volume depletion, again,  
6 the low blood pressure and have a fast heart rate.

7 Q. By "volume depletion" what are you  
8 referring to?

9 A. Dehydration specifically.

10 Q. And then muscle twitching?

11 A. There can be an electrolyte  
12 abnormalities, and it's possible you could see  
13 those with heat stroke also.

14 Q. You were asked about cooling in the  
15 emergency department. Do you know whether it's  
16 standard course to cool a heat stroke patient in an  
17 ice bath?

18 A. It would be if the temperatures were  
19 persistently elevated. Depends on what the  
20 temperature continues to be.

21 Q. And at what point in time are you looking  
22 at the temperature to make that determination?

23 A. I think we're following the temperatures  
24 continuously. If they're staying particularly over  
25 40, I think we'd be taking whatever measures we

1 needed to get the temperature down.

2 Q. If a heat stroke patient's temperature  
3 had dropped in the hours between their exposure to  
4 the heat and their presentation at the emergency  
5 department, if it had dropped below 40 degrees,  
6 would you expect to see an ice bath used?

7 A. Wouldn't treat it unless it was present.

8 Q. You were asked if you knew that 80 to  
9 90 percent of cooled heat stroke patients recover.  
10 Does that statistic depends on factors other than  
11 cooling? Or do you know whether that statistic is  
12 invalid?

13 A. As far as that statistic -- you know --  
14 again, just depends on the spectrum of the disease.  
15 I think it's probably fair to say the majority of  
16 people that have some degree of heat stroke, heat  
17 exposure, are going to do well. It's the high --  
18 the end-organ damage patients that have a high  
19 mortality.

20 Q. What is it about heat stroke that can  
21 cause organs to begin to become damaged?

22 A. Well, I think we kind of just discussed a  
23 few of these things. First of all, the coagulation  
24 properties and stuff. The temperature itself  
25 affects that. I think it also results in

1 significant dehydration and decreased oxygen  
2 delivery to the major organs.

3 And it can really result in end-stage  
4 damage to kidneys, liver, brain. Brain is a real  
5 critical one in making the heat stroke diagnosis.  
6 Also you'd expect to see mental status changes.

7 Q. Turning to the list of factors that we  
8 were talking about, for example, the sweating  
9 factors, is there a medical term for sweating.

10 A. Diaphoresis.

11 Q. Do you know whether Liz Neuman was  
12 observed sweating when she presented?

13 A. Not by myself.

14 Q. Doctor, I'm going to -- do you still have  
15 those exhibits in front of you?

16 A. Yes.

17 Q. Would you turn to Bates 7091.

18 A. Which patient?

19 Q. For Liz Neuman. Excuse me. I'm looking  
20 at Mr. Ray. Give me just a moment here.

21 Would you turn to No. 3015 for  
22 Ms. Neuman.

23 MS. DO: The exhibit number?

24 THE COURT: The exhibit number?

25 MR. HUGHES: That should be Exhibit 365.

1 THE WITNESS: 366 is what I have.  
 2 MR. HUGHES: 366. And does Bates 3015 show  
 3 whether or not diaphoresis was present in  
 4 Ms. Neuman when she presented at the emergency  
 5 department on October 8?  
 6 THE WITNESS: Says no diaphoresis.  
 7 Q. BY MR. HUGHES: Is diaphoresis one of the  
 8 factors you would be look for in a cholinergic  
 9 toxidrome?  
 10 A. **It would be consistent with that. Yes.**  
 11 **It's one of the factors.**  
 12 Q. Now, with respect to Sidney Spencer, do  
 13 you know whether diaphoresis was present when she  
 14 presented to the emergency department?  
 15 A. **Not by me. But I'm not sure about the**  
 16 **emergency department.**  
 17 Q. And specifically I'm referring to  
 18 Exhibit 222.  
 19 A. **Okay.**  
 20 Q. Bates page 2080.  
 21 A. **Mine starts at 2083.**  
 22 Q. Your Exhibit 222 starts at 2083?  
 23 A. **They're just not in order.**  
 24 Q. Okay. Does that indicate whether  
 25 Ms. Spencer exhibited diaphoresis when she

1 presented to the emergency department?  
 2 A. **Says no diaphoresis.**  
 3 Q. How about nausea or vomiting?  
 4 A. **No nausea or vomiting.**  
 5 Q. You mentioned to Ms. Do that excess  
 6 salivation can also be a sign; is that correct?  
 7 A. **Of cholinergic. Yes.**  
 8 Q. Do you know whether Ms. Spencer exhibited  
 9 any signs of excess salivation?  
 10 A. **Not that I documented. I don't remember**  
 11 **for sure in the emergency department.**  
 12 Q. Do you have page No. 2084?  
 13 A. **No excessive salivation. Dr. Earl's**  
 14 **note.**  
 15 Q. And turning your attention back to  
 16 Ms. Neuman, do you know whether she had any signs  
 17 of wet or dry mucosa when she presented to the  
 18 emergency department? And specifically I'm  
 19 referring to Bates 3016 on Ms. Neuman.  
 20 A. **This is my note. It doesn't comment on**  
 21 **dry mucosa and red eyes.**  
 22 Q. I'm sorry. What did you say?  
 23 A. **Dry mucosa. And nothing about**  
 24 **salivation.**  
 25 Q. Okay. Would you expect to see salivation

1 with dry mucosa?  
 2 A. **No.**  
 3 Q. In fact, one of the signs and symptoms of  
 4 a cholinergic toxidrome would be a moist mucosa;  
 5 isn't that correct?  
 6 A. **Yes.**  
 7 Q. Ms. Do asked you about whether  
 8 organophosphates were one of the more common  
 9 poisons or pesticides that's used. Do you recall  
 10 that?  
 11 A. **Yes.**  
 12 Q. Do you know whether it's a common  
 13 pesticide?  
 14 A. **I don't know the data specifically on**  
 15 **that. I know it's been -- traditionally it's**  
 16 **definitely been a documented exposure and into**  
 17 **toxicity. I think because of that it's tried to be**  
 18 **limited. I don't know how -- to what extent it's**  
 19 **been limited.**  
 20 Q. And, in fact, you mentioned in all the  
 21 years you've practiced, you haven't actually had to  
 22 treat a person who has been poisoned by  
 23 organophosphates?  
 24 A. **That's correct.**  
 25 Q. I imagine that would -- the patients that

1 you have treated over the years would include  
 2 people who use common household pesticides and  
 3 things of that nature around their homes; correct?  
 4 A. **I presume so. Yes.**  
 5 Q. And of all those people, you never found  
 6 one who was poisoned by exposure to it?  
 7 A. **Correct.**  
 8 Q. You were asked some questions about  
 9 information that you had. Did anyone tell you how  
 10 long the sweat lodge lasted?  
 11 A. **I didn't know the details of that. No.**  
 12 Q. Would your diagnosis on the cause of  
 13 death for Liz Neuman be affected if you knew that  
 14 the sweat lodge ran about two hours in length?  
 15 A. **I think the time frame is important to**  
 16 **some extent. But it's variable in what the**  
 17 **temperature was and all those things as well. It's**  
 18 **a factor. Yes.**  
 19 Q. What do you mean by variables in  
 20 temperature? What sort of temperatures would you  
 21 expect to see that could cause heat stroke?  
 22 A. **I don't have an exact number for that**  
 23 **other than just to say the warmer it is and the**  
 24 **longer duration, the more likely to have problems.**  
 25 Q. What about steam inside the room? Could

1 that affect whether someone succumbs to heat  
2 stroke?

3 **A. The steam itself can increase the**  
4 **temperature. So obviously in that sense, yes.**  
5 **There was a concern initially there was smoke. And**  
6 **that was the thought of the carbon monoxide. But**  
7 **steam wouldn't show up if that was the case.**

8 **Q.** In fact, would the steam make -- would a  
9 very humid, steamy environment make it easier or  
10 more difficult for a patient to give off heat  
11 through sweating?

12 **A. It would slow evaporation down if it was**  
13 **steamier.**

14 **Q.** Ms. Do asked you on some of the other  
15 pages on that chart whether a whole bunch of  
16 different signs and symptoms pertain to the  
17 cholinergic or anticholinergic toxidromes. And  
18 on a number of them you mentioned they were  
19 nonspecific. Can you tell us what you mean by  
20 "nonspecific sign or symptom."

21 **A. Well, just in the sense that there is**  
22 **pretty broad differentials on a lot of these**  
23 **things. To have a fast heart rate is not specific**  
24 **to any toxidrome. There is -- as we discussed,**  
25 **there are specific chemicals that are going to have**

1 one effect versus the other.

2 **But there is people that can come in from**  
3 **infections and other things and have a fast heart**  
4 **rate and have dry mucosa. And they could not have**  
5 **a toxidrome in the first place and a lot of these**  
6 **symptom.**

7 **If you had cancer and you were**  
8 **dehydrated, the dry mouth, the fast heart rate, low**  
9 **blood pressure, you would have abnormal findings to**  
10 **any one of these. So these aren't things that are**  
11 **specific to a toxidrome either.**

12 **Q.** What would, if anything, would they be  
13 specific to? Or why would you expect to see some  
14 of the factors that you were discussing that are  
15 not specific to a particular toxidrome?

16 **A. I think I would say just in general is**  
17 **that in intensive care unit we see sick people and**  
18 **they're decompensated. And it's common to see**  
19 **patients that aren't doing well with low blood**  
20 **pressures and fast heart rates, a lot of these same**  
21 **kind of issues.**

22 **Q.** Ms. Do -- turning your attention now to  
23 another area, Ms. Do asked if I.V. fluid could  
24 rehydrate an asystolic patient. Do you remember  
25 those questions?

1 **A. Yes.**

2 **Q.** And an asystolic patient is a person  
3 whose heart has stopped beating; correct?

4 **A. Yes.**

5 **Q.** Do you know whether if an asystolic  
6 patient were to be given an I.V. and effective CPR,  
7 could that effective CPS start perfusing the I.V.  
8 fluids through their body?

9 **A. It could.**

10 **Q.** Could that affect their hydration level  
11 after, say, 45 to 60 minutes of that?

12 **A. It could. It's probably not realistic to**  
13 **think that you're going to keep someone alive 60**  
14 **minutes with no heartbeat.**

15 **Q.** Well, let me ask you this: With respect  
16 to some of the patients, we know the times that the  
17 emergency department arrived on scene; correct?

18 **A. Yes.**

19 **Q.** And we know the time that they arrived at  
20 the hospital; correct?

21 **A. Yes.**

22 **Q.** And would you, then, defer to those times  
23 on the emergency department report as far as the  
24 time that it took for them to be transported from  
25 the scene to the emergency department?

1 **A. What's the question in regards to that?**

2 **Q.** In other words, do you believe those  
3 reports would accurately reflect how long the  
4 patients were receiving that emergency care from  
5 the EMS providers?

6 **A. I think the time of the arrival of the**  
7 **EMS to the time of the arrival of the ED should be**  
8 **accurate.**

9 **Q.** You were asked some questions about in  
10 particular the Guardian Air records for Liz Neuman.  
11 Do you recall that?

12 **A. Yes.**

13 **Q.** And do you happen to have Exhibit 369 in  
14 front of you?

15 **A. Yes.**

16 **MR. HUGHES:** Your Honor, state would move in  
17 Exhibit 792.

18 **THE COURT:** Any objection?

19 **MS. DO:** No, Your Honor.

20 **THE COURT:** 792 is admitted.

21 (Exhibit 792 admitted.)

22 **MR. HUGHES:** Doctor, over the break the  
23 Guardian Air brought us a better copy. I know the  
24 document you have is difficult to read.

25 **May I approach?**

1 THE COURT: Yes.

2 Q. BY MR. HUGHES: I'm showing you on the  
3 newly admitted exhibit the time of 1825. Do you  
4 see where it refers to an axillary temperature?

5 A. Yes.

6 Q. Of '97.5?

7 A. Yes.

8 Q. And you mentioned that an axillary  
9 temperature is not as reliable as a rectal  
10 temperature, for example. Can you tell us, is  
11 there any common wisdom as to whether an axillary  
12 temperature is higher or lower than a rectal  
13 temperature?

14 A. I think it's generally a little lower.

15 Q. And do you know why that would be?

16 A. Just presume it's more ambient air that's  
17 around. You don't get as tight a seal putting a  
18 thermometer in the armpit like that.

19 Q. Do you know whether Ms. Neuman received  
20 fluids before she arrived at the emergency  
21 department?

22 A. I don't know the details about that. No.

23 Q. And turning your attention to Bates  
24 No. 3026 in Ms. Neuman's records. Is that a record  
25 by the emergency department doctor who first

1 treated her?

2 A. Yes.

3 Q. And does that record indicate how much  
4 fluid Ms. Neuman received before she was brought to  
5 the emergency department by Guardian?

6 A. Says one liter.

7 Q. Would the receipt of approximately a  
8 liter of fluid affect those dehydration levels, the  
9 sodium and the chloride and the BUN levels, that  
10 Ms. Do was asking you about?

11 A. It would have an effect. That's not a  
12 real aggressive, and it's pretty standard amount to  
13 get a liter of fluid on the way up. It wasn't over  
14 aggressive either. It would have an effect  
15 potentially.

16 Q. What sort of effect one way or the other  
17 would it have?

18 A. If someone was dehydrated, I would expect  
19 it to increase the blood pressure and lower the  
20 pulse.

21 Q. You were asked about those numbers, in  
22 specific the sodium, the chloride and BUN, I think  
23 a UA specific gravity. Do you remember those  
24 questions?

25 A. Yes.

1 Q. And you indicated that in the clinical  
2 setting that you looked at other factors also in  
3 determining if a person was dehydrated. Can you  
4 explain how that works.

5 A. Well, just as I said, if people are  
6 critically ill, there is a lot of dynamic and  
7 there's kind of re-equilibration if there is fluid  
8 shifts. So a lot of times that will level out one  
9 way or another with the salt levels.

10 But it's -- lot of what we have to  
11 determine is based upon just the vital signs  
12 particularly and -- you know -- fast heart rate and  
13 low blood pressure indicates low volume and  
14 dehydration.

15 Another thing that we will typically do  
16 that would be a better standard is to put in  
17 central lines and get direct measurements of what  
18 pressures are in the chest, in the large blood  
19 vessels. I would say we don't typically base a lot  
20 of our treatment on the sodium and chloride level.

21 MR. HUGHES: And may I approach?

22 THE COURT: Yes.

23 Q. BY MR. HUGHES: Could I have that record  
24 right in front of you?

25 A. Sure.

1 Q. Doctor, referring to Exhibit 366, Ms. Do  
2 asked about Dr. Peterson's emergency department  
3 record. Do you remember questions about that?

4 A. Yes.

5 Q. And specifically she asked about the  
6 comment or the diagnosis on Bates 3028. Do you  
7 remember Ms. Do asked you whether it appeared to be  
8 a typo where it said consider toxidrome of an  
9 anticholinergic ingestion?

10 A. Yes.

11 Q. Based on your review of that record and  
12 of this patient's medical treatment, does that  
13 appear to be a typo to you?

14 MS. DO: Objection, Your Honor. I think that  
15 mischaracterizes my question and the testimony.

16 THE COURT: Once again, Dr. Cutshall, if  
17 you're able to answer that question, you may do so.

18 And, ladies and gentlemen, as I've  
19 indicated before, what the attorneys say doesn't  
20 constitute the evidence.

21 THE WITNESS: Just show me exactly which area  
22 you're referring to again.

23 Q. BY MR. HUGHES: Down towards -- do you  
24 see where it says, diagnosis? And then on No. 5 it  
25 says, consider toxidrome of an anticholinergic

1 ingestion.

2 **A. Some of the other ones we looked at there**  
3 **was a sense kind of explaining their train of**  
4 **thought, and there isn't on this one. I don't know**  
5 **precisely what he meant to say.**

6 **Q.** Well, let me ask you. When Ms. Neuman  
7 came to the ICU, were you considering a  
8 cholinergic or an anticholinergic possibility?

9 **A. Personally I was considering**  
10 **anticholinergic with the high blood pressure, high**  
11 **temperature and tachycardia but acknowledge that**  
12 **the pupils were inconsistent with that.**

13 **Q.** Ms. Do asked you about the record, the  
14 page before, page 3027, which indicates that  
15 Ms. Neuman was incontinent of stool and urine.  
16 Would you expect to see incontinency in an obtunded  
17 patient?

18 **A. I guess the answer -- that's a**  
19 **nonspecific finding in anyone with loss of**  
20 **consciousness. But if it were to be consistent**  
21 **with one or the other, it's more consistent with**  
22 **cholinergic.**

23 **Q.** Okay. With respect to a person's mental  
24 status, if a person is in a coma, they would be  
25 considered obtunded; is that correct?

1 **A. Yes.**

2 **Q.** And if they're in that state, you  
3 testified earlier that there would be concerns  
4 about their ability to protect or guard their  
5 airway; is that correct?

6 **A. Yes.**

7 **Q.** Would you have similar concerns or would  
8 you expect to see a patient who is in that state,  
9 who is in a coma, being able to control their  
10 bowels?

11 **A. No. That's commonly seen with someone**  
12 **that's that ill.**

13 **Q.** And then, Doctor, you prepared a report  
14 on Ms. Neuman starting with this page, the critical  
15 care evaluation. Do you recall that report?

16 **A. Yes.**

17 **Q.** Did you bring a copy of that with you?

18 **A. Yes. I have one.**

19 **Q.** I'm going to turn your attention towards  
20 the end of the report where you refer to -- you  
21 refer to the assessment and plan. And in that  
22 assessment and plan you mention a presentation  
23 appeared to be consistent with an anticholinergic  
24 state.

25 And then you indicated to Ms. Do that the

1 pinpoint pupil portion of that, in your opinion,  
2 was inconsistent with anticholinergic; is that  
3 correct?

4 **A. That was an error on my part. The other**  
5 **aspects were consistent with anticholinergic. I**  
6 **meant to say anticholinergic. I should have said**  
7 **pinpoint pupils was inconsistent with that.**

8 **Q.** And despite the fact of the pinpoint  
9 pupils, was it your opinion, then, that if there  
10 was an ingestion, it was an anticholinergic  
11 ingestion?

12 **A. To me more features were similar but**  
13 **neither one fit completely.**

14 **Q.** You also mentioned in that section under  
15 No. 4 the bleeding. You indicated she potentially  
16 would be at risk for DIC if there is heat stroke  
17 present. I think you testified earlier that  
18 Ms. Neuman, in fact, at the time of her death was  
19 suffering from DIC. Is that correct?

20 **A. Yes.**

21 **Q.** And can you explain, then, what you meant  
22 by that statement about that she would be at risk  
23 for DIC if there is heat stroke present.

24 **A. It's a feature commonly see with heat**  
25 **stroke. We were starting to see some of the**

1 **laboratories reflecting a mild level of that but**  
2 **not very significant level at that point. Had it**  
3 **not gotten any worse, I wouldn't have called those**  
4 **preliminary numbers clearly DIC.**

5 **The numbers did get worse. And they got**  
6 **summarized on the death summary. I had documented**  
7 **that she received 96 units of blood products while**  
8 **in the hospital, and that would be definitely**  
9 **consistent with DIC.**

10 **Q.** Can you tell us how long was she in the  
11 hospital for approximately?

12 **A. It was from October 8 to October 17.**

13 **Q.** And you said 96 units of blood product.

14 **A. She received predominantly FFP, which**  
15 **specifically is addressing the I and R and some of**  
16 **the clotting factors there. She had 78 units of**  
17 **FFP.**

18 **Q.** Can you tell us what that number means.  
19 In other words, can you put it into terms --

20 **A. No. It's just -- it's indicative of an**  
21 **inability to control her clotting and that there's**  
22 **a real serious derangement of her clotting at that**  
23 **point.**

24 **Q.** Was the fact that Ms. Neuman was  
25 suffering from DIC at the time of her death -- was

1 that one of the factors, then, that you determined  
2 to pertain to the cause of death?

3 MS. DO: Your Honor, object to the line of  
4 leading questions.

5 THE COURT: Overruled.

6 You may answer that.

7 THE WITNESS: I listed DIC as one of the  
8 causes of death that was contributing. Yes.

9 Q. BY MR. HUGHES: With respect to Sidney  
10 Spencer, you were asked some questions as to  
11 whether she had foaming at the mouth or not when  
12 she presented. Is that something you would expect  
13 to have seen documented in the emergency department  
14 record for Ms. Spencer if it was present when she  
15 presented?

16 A. **I think it potentially could have been**  
17 **documented. I don't know if I'd expect one way or**  
18 **the other.**

19 Q. In fact, do you know, Doctor, whether --  
20 do you have Exhibit 222 in front of you?

21 A. **Yeah.**

22 Q. Turning your attention to page 2079, can  
23 you tell us what's on page 2079, what sort of  
24 document it is.

25 A. **It's an admitting history and physical**

1 **exam performed by me.**

2 Q. And does that indicate -- or did you  
3 indicate whether Ms. Spencer had foaming at the  
4 mouth or dry mouth at the time she presented?

5 A. **I indicate a dry mouth when I evaluated**  
6 **her.**

7 Q. Is that something, then, that would be  
8 consistent or inconsistent with this cholinergic  
9 or this organophosphates poisoning?

10 A. **The dry mouth would be more consistent**  
11 **with an anticholinergic or not the organophosphate.**

12 Q. You were asked some questions about an  
13 elevated glucose level. Do you recall that?

14 A. **Yes.**

15 Q. And would an elevated glucose level be  
16 specific to a particular toxidrome or would it be  
17 nonspecific?

18 A. **It's not that specific, to my**  
19 **recollection.**

20 Q. And, in fact, you indicated in this case  
21 the glucose level was on the high end of what you  
22 would consider to be normal?

23 A. **Yes.**

24 Q. You were asked some questions about  
25 Mr. Stephen Ray. And I realize he's not your

1 patient. But I do want to ask a couple questions  
2 to clear up. Do you have his Exhibit 213 in front  
3 of you?

4 A. **Yes.**

5 Q. And turning to 7093 -- let me go ahead  
6 and put it up. If I can have it.

7 A. **I'm not finding it.**

8 Q. Can you see that okay up on the screen or  
9 on your screen?

10 A. **Yes.**

11 Q. We had a question come up the other day.  
12 Do you see down at the bottom of the page, 7093,  
13 says ED, emergency department, admission  
14 impression?

15 A. **Yes.**

16 Q. And No. 1, acute altered mental status?

17 A. **Yes.**

18 Q. And No. 2, rule out acute heat stroke?

19 A. **Yes.**

20 Q. Can you tell us if the term "rule out  
21 acute heat stroke" or "rule out a medical  
22 condition" -- does that have a meaning to doctors?

23 A. **I think it's, essentially, just the same**  
24 **as putting as a differential. It's a**  
25 **consideration.**

1 Q. Is that -- does that indicate whether or  
2 not heat stroke or acute heat stroke has actually  
3 been ruled out?

4 A. **No. I think it's just almost the same as**  
5 **writing -- it's part of your differential. You're**  
6 **considering heat stroke. Doesn't say whether it's**  
7 **ruled out or not.**

8 Q. In fact, just above that Dr. Daniel  
9 indicated he continues to believe hyperthermia was  
10 involved in the patient's presentation; is that  
11 correct?

12 A. **Correct. I would say "rule out" is just**  
13 **referring to the process of evaluation for heat**  
14 **stroke.**

15 MS. DO: Your Honor, so the record is clear,  
16 can we have the date of this record that we're  
17 referring to.

18 Q. BY MR. HUGHES: Do you see the date,  
19 Doctor, on the screen?

20 A. **It's October 8, 2009.**

21 Q. You were asked some questions about  
22 vision problems that Mr. Ray suffered from. Do you  
23 remember those questions?

24 A. **Yes.**

25 Q. And you were asked whether those vision

1 problems would be diagnostic of a cholinergic  
2 toxidrome. And you mentioned something about the  
3 effect of the drug that many days out. Can you  
4 tell us what you meant by that.

5 **A. I would be starting to feel that the**  
6 **acute toxicity of the drug would be wearing off in**  
7 **three or four days. It's not impossible there can**  
8 **be changes. Those changes that affect vision can**  
9 **result from those medications.**

10 **Q.** Is impaired vision diagnostic of a  
11 cholinergic toxidrome?

12 **A. It's not diagnostic by itself. No.**

13 **Q.** Is it a specific or nonspecific symptom?

14 **A. Just probably say it's not a classic**  
15 **symptom.**

16 **Q.** In fact, could vision problems be caused  
17 by, for example, an anoxic brain injury?

18 **A. Yes.**

19 **Q.** And can an anoxic brain injury be caused  
20 by heat stroke?

21 **A. Yes.**

22 **Q.** Doctor, I apologize. You're going to  
23 have to work tonight. You've been very patient  
24 with us. I don't have any more questions.

25 Before we go, the jury might.

1 THE COURT: Thank you, Mr. Hughes.

2 Ladies and gentlemen, do any of you have  
3 questions for Dr. Cutshall?

4 I guess we don't have any questions.

5 So, Counsel, may Dr. Cutshall be excused  
6 as a witness at this time?

7 MR. HUGHES: Your Honor, the state would  
8 request keep him subject to recall.

9 THE COURT: Dr. Cutshall, you will be excused  
10 temporarily from the trial. The rule of exclusion  
11 still applies to you, meaning you just can't  
12 discuss the case or your testimony with any other  
13 witness. And that's very important. You can't do  
14 that until the trial is completely over, can't  
15 communicate in any way with other witnesses about  
16 the case.

17 Okay?

18 THE WITNESS: Okay.

19 THE COURT: Thank you, sir. Your time is  
20 appreciated.

21 Ladies and gentlemen, let's go ahead and  
22 take the evening recess, please. Be back at 9:15  
23 tomorrow morning. Remember the admonition. And we  
24 will be in recess.

25 Thank you.

1 (End of partial transcript.)

1 STATE OF ARIZONA )  
2 COUNTY OF YAVAPAI ) ss: REPORTER'S CERTIFICATE

3  
4 I, Mina G. Hunt, do hereby certify that I  
5 am a Certified Reporter within the State of Arizona  
6 and Certified Shorthand Reporter in California.

7 I further certify that these proceedings  
8 were taken in shorthand by me at the time and place  
9 herein set forth, and were thereafter reduced to  
10 typewritten form, and that the foregoing  
11 constitutes a true and correct transcript.

12 I further certify that I am not related  
13 to, employed by, nor of counsel for any of the  
14 parties or attorneys herein, nor otherwise  
15 interested in the result of the within action.

16 In witness whereof, I have affixed my  
17 signature this 9th day of April, 2011.

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MINA G. HUNT, AZ CR No. 50619  
CA CSR No. 8335


1 STATE OF ARIZONA )  
2 ) ss: REPORTER'S CERTIFICATE  
3 COUNTY OF YAVAPAI )

4 I, Mina G. Hunt, do hereby certify that I  
5 am a Certified Reporter within the State of Arizona  
6 and Certified Shorthand Reporter in California.

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24 MINA G. HUNT, AZ CR No. 50619  
25 CA CSR No. 8335